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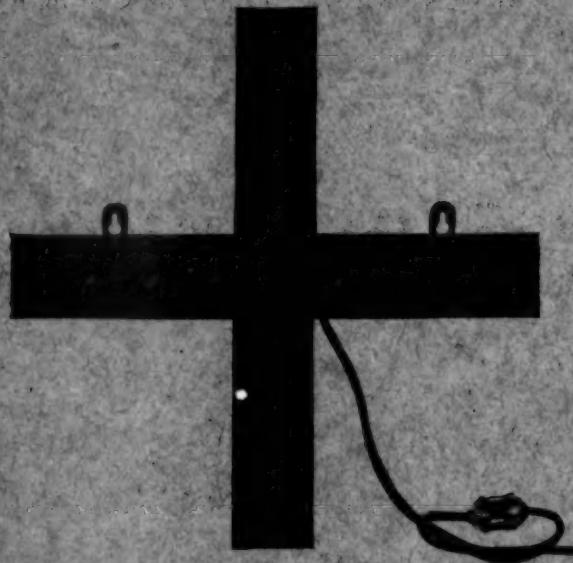
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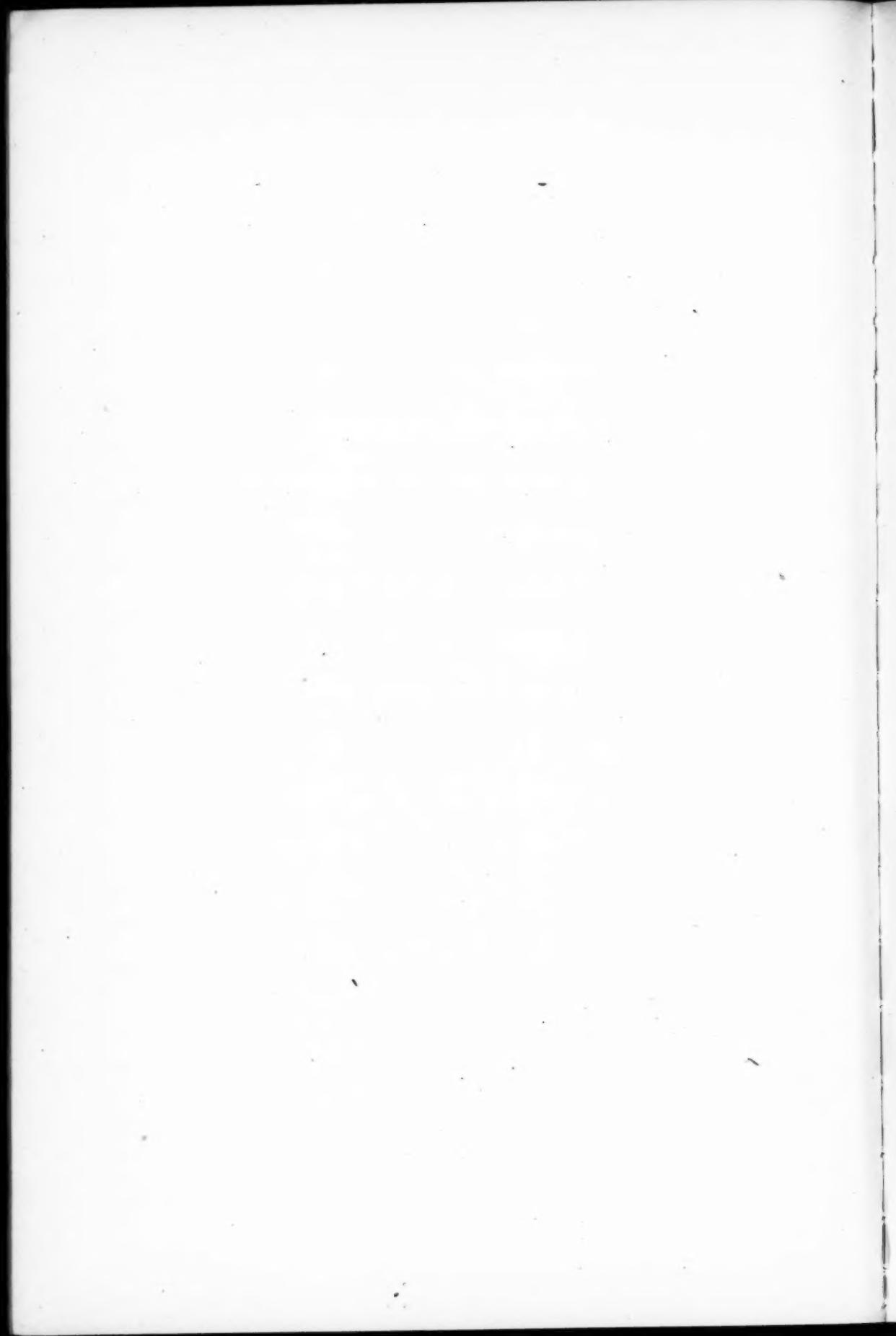
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PLATES IN VOLUME IV, 1921

| | Facing Page |
|---|-------------|
| Plate I. Leptothrix in Ophthalmology. (S. R. Gifford)..... | 1 |
| Plate II. Leptothrix in Ophthalmology. (S. R. Gifford)..... | 1 |
| Plate III. Proliferating Chorioretinitis. Right Eye, Seen in the Erect Position. (Danis), Colors..... | 153 |
| Plate IV. Persistent Hyloid Artery and Canal of Cloquet. Left Eye. (Danis), Colors | 233 |
| Plate V. Anomalous Prolongation of the Lamina Cribrosa. Right Eye, Erect Image. (Danis). Colors..... | 233 |
| Plate VI. Canal of Schlemm and Neighboring Venous Plexus. (Uribe-Troncoso). Colors | 321 |
| Plate VII. Canal of Schlemm. Angle of the Anterior Chamber. (Uribe-Troncoso). Colors | 321 |
| Plate VIII. Siderosis of Crystalline Lens. (Van Duyse and Danis). Colors | 561 |
| Plate IX. Papilloma of the Cornea. (Garraghan). Colors..... | 717 |
| Plate X. Disciform Keratitis (Bane and Bane). Colors..... | 801 |
| Plate XI. Phlegmon of the Conjunctiva (Kiehle). Colors..... | 881 |



INDEX OF NAMES

Abadie, C. 476, 526.
Adam, C. 60.
Adams, C. J. 707.
Addario La Ferla, 558.
Akatzuka, T. 308.
Akiya, H. 308.
Albright, G. C. 601.
Alexander, G. F. 676, 677.
Alger, E. M. 731.
Allen, T. D. 529.
Allport, F. 386, 722.
Ando, S. 309.
Andrews, A. H. 146.
Angelucci, A. 397.
Appleman, L. F. 369, 535.
Arisawa, 304.
Armstrong-Jones, R. 678.
Arrell, 284.
Atkinson, D. T. 876.
Atkinson, T. G. 876, 939.
Aufmwasser, H. 62, 362.
Axenfeld, T. 147, 702.

Bachstet, E. 713.
Bailey, J. H. 363.
Bailliart, 525, 558.
Bakker, S. P. 862.
Baldino, S. 66, 229, 712.
Ball, J. M. 447, 673.
Ballantyne, A. J. 680.
Bane, W. C. 212, 213, 290, 291, 377, 378, 379, 460, 541, 801, 917.
Bane, W. M. 290, 291, 377, 378, 379, 801.
Banister, J. M. 659.
Barraquer, I. 46, 904.
Barrett, J. W. 64.
Bassoe, P. 374.
Bates, W. H. 223.
Batten, R. D. 367, 369, 773.
Bagle, H. L. 850.
Behmann, A. 318.
Behr, C. 69.
Bellows, G. E. 884.
Benedict, W. L. 38, 495, 931.
Bennett, A. G. 202, 283, 361, 527, 626.
Birch-Hirschfeld, A. 638.
Blaauw, E. E. 227, 284, 528, 625.
Black, M. 48, 292, 378, 379, 380, 681.
Black, N. M. 688, 695, 819.
Blake, E. M. 16, 736.
Blaxland, F. G. 774.
Blue, J. B. 283.
Boehm, F. M. 69.
Bollack, J. 525.
Bonnefon. 46.
Booth, F. 634.
Bordley, J. 454.
Botteri, 64.
Boyd, E. T. 215, 216.
Braunschweig, P. 795.
Brawley, F. 688.
Brazeau, G. N. 277, 674.
Brouwer, B. 475.
Brown, E. J. 365, 665, 854.

Brown, E. V. L. 375, 465, 467.
Browning, S. H. 469.
Brückner, A. 711.
Bruner, A. B. 503.
Buck, R. H. 906.
Burnham, G. H. 358.
Butler, T. H. 469.
Byers, W. G. M. 917.

Callfas, W. F. 459.
Calhoun, F. P. 101.
Cameron, W. G. 620.
Campbell, D. M. 336.
Carter, J. M. 336.
Carvill, L. M. 742.
Cecchetto, E. 477.
Cemach, A. J. 65.
Chaillous, J. 525.
Chance, B. 127, 370, 524, 525, 625, 641, 687, 864, 868.
Chevallereau, A. 318.
Charles, E. 67.
Charles, J. W. 207, 774, 777, 778.
Charlton, C. F. 647.
Chouulant, L. 144.
Clapp, C. A. 194.
Clegg, J. G. 614, 676.
Clemesha, J. C. 284.
Colin, A. 871.
Collins, E. T. 294, 679.
Conant, E. F. 290.
Cook, F. S. 919.
Coover, D. H. 216, 514.
Coppez, H. 46, 47, 67, 279, 281, 759.
Copps, L. A. 810.
Cordes, A. B. 123, 429.
Coulomb. 46.
Couper. 625.
Cowan, A. 28, 604.
Cowper, H. W. 526, 792.
Crisp, W. H. 188, 541, 683, 927.
Cross, G. H. 867.
Curran, E. J. 889.

Danis, M. 153, 233, 279, 313.
Darier, A. 701.
Davis, A. E. 551.
Dean, F. W. 295, 537.
Decker, J. C. 854.
Deichler, L. W. 624.
Delogé, C. 407.
Derby, G. S. 334.
Dercum, F. X. 130.
De Waele. 47.
Dewey, J. H. 687.
Dickinson, G. 270.
Dimitry, T. J. 655.
Dimmer, F. 938.
Dodd, O. 727.
Doherty, W. B. 450.
D'Ombrain, E. A. 616.
Dor, L. 711.
Douglass, B. 551.
Dubois, H. F. 771.

Duckworth, G. M. 743.
 Duncan, R. 520.

Eckstein, A. 66.
 Eigler, C. O. 380.
 Elewaut. 397.
 Ellett, E. C. 224, 282, 283, 371, 458, 459.
 636, 779, 780, 869, 870.
 Elliot, R. H. 222.
 Engelking, E. 66.
 Ewing, A. E. 775, 776, 777.

Fagin, R. 283, 372, 373, 458.
 Favange-Bruyel, A. J. 796.
 Feingold, M. 161.
 Fejer, J. 123.
 Ferree, C. E. 22, 925.
 Ferrell, J. R. 918.
 Fetterolf, G. 455.
 Finnoff, W. C. 215, 251, 291, 380, 642, 927.
 Fisher, J. H. 615, 675.
 Fisher, W. A. 288, 289.
 Fleck, H. K. 573.
 Fox, L. W. 543.
 Francis, L. M. 202, 528, 625.
 Franklin, W. S. 123, 429.
 Franz, G. 317.
 Friedenwald, H. 431.
 Fringer, W. R. 276.
 Frogé. 525.
 Fuchs, E. 393, 787, 875.
 Fusita. 304.

Gallemarts. 46, 60, 389.
 Garraghan, E. F. 717.
 Garrison, F. H. 385.
 Gaudissart, P. 500.
 Gifford, H. 295, 327, 604, 803, 889.
 Gifford, S. R. 1, 460, 489, 538, 566, 689, 941.
 Giraud, P. 558.
 Giessing, H. G. A. 315.
 Gleason, E. B. 456.
 Goar, E. L. 523.
 Goerlitz, M. 228.
 Goldberg, H. G. 625, 866.
 Goldenburg, M. 286, 287, 688.
 Goldflam, S. 316.
 Good, R. H. 532, 597.
 Goulier. 526.
 Gradle, H. S. 427, 519, 530, 533, 672, 694,
 895.
 Grayson, C. P. 454.
 Green, A. S. 595, 705.
 Green, J. 206, 208.
 Griscom, J. M. 347, 370, 524.
 Gross, J. 777.
 Grosz, E. de. 788.
 Guglianetti, L. 64.
 Guillaume, A. C. 384.
 Guillary, H. 396.
 Guilleuma, S. de. 477.
 Guiral y Viondi, R. 300.

Haab, O. E. 229.
 Haan, L. B. de. 861.
 Haas, H. K. de. 761.
 Hagen, S. 708.
 Hallett, DeW. 203.
 Halliday, J. C. 616.

Hansell, H. F. 127, 537, 864, 922.
 Harding, F. B. 744.
 Hardy, W. F. 206, 208.
 Hare, H. A. 128.
 Harman, N. B. 293, 294, 468, 614, 824.
 Harris, W. 614.
 Hartridge, H. 148.
 Hartshorne, I. 353.
 Hassin, G. B. 373.
 Hata. 306.
 Hayano. 303.
 Hayashi. 309.
 Heckel, E. B. 273.
 Heed, C. R. 535, 865, 867.
 Hektoen, L. 909.
 Henry, W. 772.
 Hepburn, M. 367.
 Hess, C. v. 318.
 Higbee, E. H. 776, 779.
 Higgins, S. G. 911.
 Hine, M. L. 295, 615.
 Hirsch, C. 944.
 Hiwatari, K. 200.
 Hogue, G. I. 592.
 Holl. 303.
 Holloway, T. B. 685, 868, 924.
 Holmes, G. 612.
 Holmes-Spicer, W. T. 367.
 Holzer, W. F. 746.
 Hoorens. 281.
 Horner, B. S. 123.
 Howard, H. J. 752, 878, 940.
 Howe, L. 695.
 Huber, O. 713.
 Hurst, A. F. 633.
 Hurst, V. R. 277.

Igarashi, T. 308.
 Imanishi. 309.
 Inouye. 307.
 Ishiwara, S. 305.
 Ishizu. 307.
 Israel, J. P. 856.
 Itch, Y. 309.

Jackson, E. 52, 53, 55, 119, 133, 135, 142,
 143, 213, 218, 220, 296, 381, 383, 470, 471,
 547, 629, 632, 673, 679, 781, 783, 872, 873,
 935, 937.
 Jackson, T. 467.
 James, R. R. 677.
 Jendralski, F. 710.
 Jess, A. 314.
 Jocqs. 708.
 Juler, F. 678.
 Junius. 391, 555.

Kagoshima. 307.
 Kahn, W. W. 438.
 Kearney, J. A. 203.
 Keegan, J. J. 835.
 Keen, W. W. 231.
 Keiner, C. B. J. 769.
 Kiehle, F. A. 881.
 Kimberlin, J. W. 43.
 Kiribuchi. 313.
 Kirkendall, J. S. 301.
 Kleefeld. 46, 47, 279, 389, 758.
 Koellner, H. 787.

Koeppe, L. 712, 786, 877.
 Komoto, J. 58, 871.
 Kooy, J. M. 608.
 Krauss, F. 534.
 Kress, G. H. 799.
 Kubik, J. 557, 944.
 Kuhnt, H. 145.
 Kumagal, N. 305.
 Kusama. 305.

Lafon, C. 149, 942.
 Lamb, H. D. 197, 207.
 Lamb, R. S. 133, 668, 864.
 Lampert, P. 315.
 Lancaster, W. B. 135.
 Landolt, E. 704.
 Landolt, M. 345, 704.
 Lang, B. T. 468.
 Lapersonne, F. de. 639.
 Larsson, S. W. 478.
 Lavat. 525.
 Lawford, J. B. 467.
 Le Boucq. 759.
 Lemere, H. B. 295, 538.
 Leplat, G. 280.
 Lewis, A. C. 870.
 Lewis, F. P. 258, 283, 284, 526, 625, 626, 789.
 Lewis, W. W. 747.
 Li, T. M. 68.
 Libby, G. F. 290, 378, 540, 682.
 Lifschutz, J. 288.
 Lindner, K. 393, 943.
 Lobel, A. 393.
 Loeb, C. 265, 939, 943.
 Longuet. 526.
 Loring, J. B. 690.
 Lowell, W. H. 739.
 Luedde, W. H. 205, 208.

McCaw, J. A. 539.
 McKeown, E. E. 539.
 Mackay, G. 467.
 Macleish, A. B. 724.
 McMillan, J. A. 448.
 McMullen, W. H. 294, 615, 773.
 McReynolds, J. O. 551.
 Maddox, E. E. 571.
 Magitot, A. 557, 709.
 Magruder, A. C. 48, 214, 927.
 Malling, B. 794.
 Mann. 774.
 Marbaix. 46, 47, 282, 758.
 Marbourg, E. M. 49.
 Marks, E. O. 521.
 Marlow, F. W. 238.
 Maruo. 304.
 Marx, E. 612, 759, 863.
 Masuda. 311.
 Matson, W. F. 380.
 Mattice, A. F. 621.
 Maynard, F. P. 57, 549.
 Mayou, M. S. 295, 680, 774.
 Mazumoto. 305.
 Mazzel. 654.
 Meller, J. 550.
 Meyling, H. J. 607.
 Miller, C. M. 44.
 Miller, E. B. 516.

Millette, J. W. 930.
 Mohr, T. 67.
 Morax, V. 46, 472, 635, 784.
 Moretti. 708.
 Moxon, F. 772.
 Mukai. 794.
 Murphy, F. G. 705.
 Myashita. 303.

Nakaizumi, G. 302.
 Nakamura, T. 306, 557.
 Neame, H. 294.
 Neerer, E. R. 48, 49, 51, 293, 379, 541.
 Niimi. 308.
 Nogowa. 304.
 Norton, B. 72.

O'Connor, R. 388, 838.
 Oden, P. W. 365.
 Oertel, T. E. 748.
 Offret. 318.
 Oguchi, C. 308, 310.
 Ohsaki, O. 315.
 Okayama. 309.
 Oliver, M. W. B. 467.
 Olsho, S. L. 644, 922, 923.
 Osaki. 304.
 Oswald, A. 315.
 Outen. 934.

Pa, T. C. 795.
 Pacheco-Luna, R. 175, 595, 705.
 Parker, E. F. 475.
 Parker, W. R. 52, 650.
 Parsons, J. H. 678.
 Paton, L. 467, 613.
 Pattee, J. J. 683, 928.
 Patterson, J. A. 50, 513.
 Patton. 793.
 Patton, J. M. 422, 459, 605.
 Peabody, H. C. 914.
 Peery, T. E. 748.
 Percival, A. S. 678.
 Perlmann, I. 362.
 Peter, L. C. 132, 301, 455, 622, 865, 866, 925.
 Pfahler, G. E. 457.
 Pfingst, A. O. 436.
 Pickard, R. 367.
 Pockley, G. A. 616.
 Polack. 525, 526.
 Posey, W. C. 455, 524, 537, 866, 867.
 Post, L. 109, 207, 330, 777.
 Potter, J. B. 538.
 Poulard. 525.
 Poynter, C. W. M. 295.
 Putnam, W. G. 605.
 Pyle, W. L. 623.

Quine, W. E. 934.

Radcliffe, McC. 369, 370.
 Ralston, W. 523.
 Ramsay, A. M. 676.
 Rand, G. 22, 925.
 Randall, B. A. 686, 921.
 Rasquin. 280, 758.
 Ravdin, M. 750.
 Reese, W. 868.

Reinflet. 708.
 Rochat, G. F. 609, 859.
 Rochon-Duvigneaud. 526, 714.
 Roelofs, C. O. 611, 768, 860.
 Roemer, P. 147.
 Roll, G. W. 367, 773.
 Rubbrecht. 281.
 Rubendall, C. 460.
 Rush, C. C. 44, 314.

Saenger, A. 874.
 Saint Martin. 66.
 Sakaguchi. 308.
 Salomonson. 367, 556.
 Santos-Fernandez, J. 32.
 Satterlee, R. H. 626.
 Scarlett, H. W. 687, 868.
 Schaeffer, J. P. 451, 683.
 Schoute, J. G. 862.
 Schwartz, F. O. 806.
 Schwarzkoff, G. 317.
 Schweinitz, G. E. de. 91, 131, 559, 686, 786, 937, 939, 940.
 Schwenk, P. N. K. 369, 876.
 Seto, T. 311.
 Sewall, H. 548.
 Shahan, W. E. 109, 778, 779.
 Shambaugh, G. E. 146.
 Shastid, T. H. 227, 302.
 Sheard, C. 636.
 Sherwood-Dunn. 699.
 Shields, J. M. 217, 461, 540.
 Shima, G. 310.
 Shimizu. 304.
 Shiodzi, Y. 309.
 Shumway, E. A. 132, 623, 624.
 Simpson, W. L. 780.
 Sinclair, A. H. H. 468.
 Singer, H. D. 374.
 Sinha, C. C. 65.
 Smith, H. 559, 631, 900, 929.
 Smith, H. J. 374.
 Smith, S. 211.
 Snell, A. C. 419, 526, 529, 625.
 Snellen, H. 762, 858.
 Sonnen, A. 760.
 Spearman, C. 678.
 Spencer, F. R. 216, 378, 461, 542.
 Spengler, J. A. 401, 791.
 Stack, E. H. E. 293.
 Stalcovici, N. 393.
 Stanford, J. B. 779.
 Stevens, G. T. 552.
 Stieren, E. 209, 424, 526.
 Stillwill, H. R. 216, 379.
 Strader, G. L. 213, 292, 541.
 Strickler, D. A. 293, 461.
 Suker, G. F. 285, 688.
 Sumner, P. 356.
 Swift, G. W. 124, 620.
 Szily, A. v. 230, 396.

Taylor, J. 615.
 Ten Doeschate, G. 607, 763.
 Terlinck. 46.
 Terrien, F. 526, 785.
 Terson. 525.
 Thomas, H. G. 853.

Thompson, A. H. 367, 368.
 Thompson, H. M. 50, 51, 461, 462, 927, 928.
 Thomson, E. S. 507.
 Thorington, J. M. 740.
 Titterington, M. B. 205.
 Tivnen, R. J. 289.
 Treigny, P. M. de. 525.
 Tresling, J. H. 151, 763.
 Tydings, O. 933.

Uhthoff, C. A. 397.
 Uribe-Troncoso, M. 140, 321.

Vall, D. T. 464.
 Valude. 525.
 Van der Hoeve, J. 610, 759, 766, 858, 862.
 Van Duyse, D. 47, 279, 280, 561, 758, 794.
 Van Kirk, V. E. 212.
 Van Lint. 47, 759.
 Veasey, C. A. 846.
 Verhoeff, F. H. 155.
 Verwey, A. 859, 862.
 Von der Heydt, R. 171, 287, 465.

Waardenburg, P. J. 580, 771, 861.
 Walker, C. E. 377, 379, 539.
 Walker, S. 533.
 Wallace, F. E. 49, 682, 926.
 Weed, H. 527, 694.
 Weekers, L. 47, 280, 757.
 Weeks, J. E. 716.
 Wertheim Salomonson, J. K. A. 556.
 Weve, H. 612, 760, 762.
 Wheeler, J. M. 481.
 White, J. W. 276.
 Wibaut, F. 609.
 Wible, E. E. 210.
 Wiegmann, E. 318.
 Wiener, M. 299.
 Wiesfelt, W. A. 390.
 Wilbrand, H. 874.
 Wilder, W. H. 52, 463, 530, 533, 690.
 Williamson, F. A. 467.
 Wilmer, W. H. 73, 127.
 Wilson, S. A. K. 64, 678.
 Withers, S. 8.
 Wold, K. C. 43.
 Wood, C. A. 58, 146, 300, 385, 937.
 Wood, D. J. 677.
 Woodruff, F. E. 206.
 Woodruff, H. W. 206, 462, 917, 933.
 Woods, H. 52.
 Worth, C. 679, 704, 787.
 Wright, R. E. 445, 793.
 Wunderlich, G. 68.
 Würdemann, H. V. 61, 141, 446, 617, 619, 631, 699, 851, 877.

Yamado, K. 310.
 Yankauer, S. 685.
 Yano, F. 719.

Zeemann, W. P. 607, 768, 860.
 Zentmayer, W. 371, 536, 622, 685, 687, 922, 923.
 Ziegler, S. L. 865, 921, 925.
 Zimmermann, C. 18.
 Zur Nedden. 70.

SUBJECT INDEX

A number in heavy face type gives the page of an original article, including book notices, editorials and correspondence. Numbers (in brackets) refer to abstracts, including those given in Society proceedings. Other numbers indicate incidental mention of a subject. Names are indexed separately, see page v.

Abducens paralysis, (462).
ring, **419**, (625).
Abscess peritonsillar, (276).
Abstracts, 64, 148, 228, 313, **474**, 554, 871, 941.
Accidents of labor, (862).
Accommodation, 265, **296**, 305, 356, 390.
paralysis of, 43, 276, 558.
Acuity of vision, (678), (862).
Adaptation, (557).
Adrenalin, (280).
Advancement, (708), (921).
After cataract, **902**.
Age and refraction, (676).
Alcohol, 123, **854**.
Amaurosis, fleeting, (64), (558).
See also Blindness.
Amaurotic idiocy, **203**, (309), (535).
Ambidexterity, **44**, (388).
Amblyopia, congenital, **458**.
ex anopsia, (678).
see also Toxic.
Ammonia burns, (219).
Anatomy, (144).
of evulsion of optic nerve, (713).
of lacrimal apparatus, (683).
Anemia, (536).
Anesthesia, (699), (859), (871), (944).
Angioma, (616).
Angiomatosis, (151), (697).
Angiosarcoma, 91.
Angiosclerosis, **810**.
Anisocoria, (587).
Anomalies, 279, 315.
iris, (51).
muscle, **523**.
retinal, **202**, 233.
Anterior chamber, and heterologous sera, (712).
sugar in, (303).
tumor of, (607).
Aphakia, **258**, **276**, (296).
Aqueous, (303).
reforming of, (708).
Arcus juvenilis, (66).
Arsphenamin, (928).
Arteriosclerosis, **495**.
Arthritis deformans, **431**.
Artificial eyes, (467).
Asepsis, **699**.
Asteroid hyalitis, **155**, 380.
Asthenopia, **218**, 475.
Astigmatism, (22), (308).
tests for, **571**.
Atresia, lacrimal, (685).
Atrophy, iris, (478).
optic nerve, (293), (307), (347), (459), (562), (537).
Aviation, (144).
Avulsion, (67), (713).
Bacteriology, **2**, (65), 155.
Barraquer's operation, **595**.
Bird's fovea, (714).
Biographic sketches, 227, 302, 552.
Blepharochalasis, **273**, (295).
Blepharoconjunctivitis, **489**.
Blind in literature, (640).
relief fund for, (72), 152, 640.
Blindness, (228), (458), (619).
congenital, (458).
eclipse, (314).
hysteria, (283), **629**, (633).
prevention of, **824**.
Blind spot, (396), (530), **665**.
Blood pressure, (47).
reaction, (280).
tension, 500.
Books—
Adam, C. Taschenbuch der Augenheilkunde, 60.
Atkinson, D. T. Treatise on Cataract, 876.
Atkinson, T. G. Oculo-Refractive Cyclo-pedia and Dictionary, 876, 939.
Aviation Medicine in the A. E. F., 144.
Axenfeld, T. Lehrbuch und Atlas der Augenheilkunde, 147, 702.
Bates, W. H. Cure of Imperfect Sight by Treatment without Glasses, 223.
Choulant, L. History and Bibliography of Anatomic Illustrations, 144.
Davis, A. E., and Douglass, B. Nursing in Eye, Ear and Throat Diseases, 551.
Darier, A. Traité Complet de Thérapeutique Oculaire Général et Spéciale, 791.
Dimmer, F., Der Angenspiegel und die ophthalmoskopische Diagnostik, 938.
Elliot, R. H. Tropical Ophthalmology, 222.
Fuchs, E. Der Lehrbuch der Augenheilkunde, 787.
Festschrift zur des Sebzigsten Geburtstages, 875.
Gallemaerts, E., and Kleefeld, G. Etude Microscopique de l'Oeil Vivant, 60.
Guillaume, A. C. Sympathetic System, 384.
Guiral y Viondi, R. La Ciurgia del Globo Ocular y Sur Tenica, 300.
Hurst, A. F. Psychology of Special Senses and Their Functional Disorders, 633.
Koeppe, L. Die Diathermie und Lichtbehandlung des Auges, 871.
Microscopy of the Living Eye, 786.
Koellner, H. Eye Ground in General Diseases, 787.

Komoto, J. Jubilee Volume, 58.
 Kuhnt, H. Festschrift zum 70 Geburtstag, 145.
 Landolt, E., and M. Defective Movements and Their Diagnosis, 704.
 Maynard, F. P. Manual of Ophthalmic Operations, 549.
 Meller, J. Augenärztliche Eingriffe, ein Kurzes Handbuch für angehende Augenärzte, 550.
 Morax, V. Glaucome et Glaucomateux, 472.
 Precis d'Ophthalmologie, 635.
 Pathologie Oculaire, 784.
 Murphy, F. G. Be Beautiful in Glasses, 705.
 National Safety Code for Protection of Head and Eyes of Industrial Workers, 474.
 Roemer, P. Lehrbuch der Augenheilkunde, 147.
 Schweinitz, G. E. de, Diseases of the Eye, 786.
 Sheard, C. Transmission of Radiant Energy by Ophthalmic Glasses, 636.
 Sherwood-Dunn. Regional Anesthesia, 699.
 Terrien, F. Chirurgie de l'Oeil et des Annexes, 785.
 Transactions, American Academy of Ophthalmology and Oto-Laryngology, 383.
 — American Ophthalmological Society, 384.
 — Belgian Ophthalmological Soc., 46.
 — College of Physicians of Philadelphia, 385.
 — Colorado Congress, 133.
 — Ophthalmological Society United Kingdom, 473.
 — Section on Ophthalmology A. M. A., 59.
 Wilbrand, R. V. and Saenger, A. Die Neurologie des Auges, 874.
 Wood, C. A. American Encyclopedia and Dictionary of Ophthalmology, v. 17, 300, v. 18, p. 937.
 — and Garrison, F. H. Physician's Anthology of English and American Poetry, 385.
 Worth, C. Squint, 704, 787.
 Year Book Series, Eye, Ear, Nose and Throat, 58, 146.
 Bordet reaction, (280).
 Botulism, (55).
 Brain and ocular disease, (537), 819.
 Burns, (210), 215.
 Butyn, (695).
 Campimeter, (212), (294).
 Cancer, 52.
 Canaliculus, (215), (295), (314).
 Capsulotomy, (377).
 Carbonic acid snow, (308).
 Carbon monoxid, 73, 127.
 Carcinoma, 8, 9, 808, 251, (304).
 Cardiovascular retinitis, 495.
 Cataract, 673, (871), (876).
 — after cataract, 902.
 and age, 911.
 and glaucoma, 424, (526).
 classification of, 140, (299).
 congenital, (622), (927).
 coralliform, (536).
 coronary, (315), (464).
 extraction, (47), (224), (289), (386), 445, (543), 595, (619), 631, (636), 846, 859, 911.
 hereditary, (370).
 lamellar, (676).
 radium treatment in, 427.
 secondary, (458).
 senile, (51), (650), 846, 900, 911, (929).
 traumatic, (370).
 zonular, (459).
 Certificates in ophthalmology, 63.
 Chiasm, (862).
 Choked disc, (525).
 Chiidhood diseases, 914.
 Choroid exudate in, (866).
 hemorrhage, (216).
 — rupture of, (283), (929).
 Chorioretinitis, (153), (213), (372), (476), (927).
 Choroiditis, (46), (459), (461), (534).
 Ciliary segment of eye, (370).
 Circulation, ocular and general, (281).
 Clinics, 62, (232), 705.
 Coccidia in conjunctiva, (308).
 Cochlear reflex, (65).
 Coloboma, iris, (51), (282), (927).
 — macula, (367).
 — optic nerve, (921).
 Color fields, (925).
 — sense, (309), (612).
 — test, (66).
 Commotio retinae, (311), (467).
 Compensation, 803.
 Congress, international, 142, 299, 301, 383, 547, 636.
 Conjunctiva, coccidia in, (308).
 — extension of on cornea, (677).
 — phlegmon of following operation, 881.
 — phlyctenules in, (612).
 Conjunctival flap, (292).
 folliculosis, 141, 918.
 — keratosis, (69).
 Conjunctivitis, acute, (295), 489.
 — gonorrhreal, (477).
 — phlyctenular, (929).
 — vernal, (46), (391).
 Convergence paralysis, 856.
 Cornea, ectasia of, 674.
 — injury to, (46), (210), (292), (295).
 — nutrition of, (305).
 — opacity of, (373), (393).
 — papilloma of, 718.
 — regeneration of, (305).
 Corneal dystrophy, (279).
 — elasticity, (315).
 — keratosis, (69).
 — loupe, (468).
 — perforation, (46).
 — ulcer, (161), 407, (460), 604, (688), (708), 917.
 Corrections, 874, 937.

Correspondence, 51, 301, 475, 551, 636, 706, 877, 939.
 Cranial development, (270).
 Cryptophthalmos, (48).
 Crystalline lens, dislocation, (50), (217), (290), (534).
 reactions of to precipitin, 909.
 refractivity of, (48).
 siderosis of, (280), 561.
 Cultures, 2.
 Cyclitis, (676).
 Cycloplegia, (25).
 Cyst, iris, (295), (616).
 lacrimal, (557).
 lid, (616).
 retinal, (279).
 Cysticercus, (397).
 Dacryocystitis, (199), (207), (216), 447.
 Deaths:
 Abney, Sir W. de W., 230.
 Adams, C., 797.
 Arnold, H. L., 797.
 Aschman, G. A., 947.
 Ayres, S. C., 879.
 Bell, W. N., 71.
 Benedetti, A., 71.
 Bettingen, J. W., 319.
 Black, J. A., 879.
 Brown, H. H., 479.
 Brownfield, R. R., 638.
 Buxton, A. St. C., 319.
 Campbell, F. F., 227.
 Chamberlain, J. W., 715.
 Chase, W. L., 879.
 Conkey, C. D., 797.
 Crawford, D. A., 797.
 Delany, T. W., 230.
 Dodd, H. W., 797.
 Esterly, D. E., 559.
 Fortunati, A., 319.
 Harper, J. E., 230.
 Hawley, A. W., 71, 302.
 Higgens, C., 319.
 Howland, E. J., 879.
 Jackson, J. L., 879.
 Juler, H. E., 559.
 Julien, W. F., 879.
 Kalish, R., 715.
 Leonard, P. L., 947.
 Means, J. F., 797.
 McIlwaine, C. H., 559.
 MacLean, M., 319.
 Manche, C., 638.
 Mathewson, A., 319.
 Maynard F. P., 947.
 Meek, J. A., 368.
 Moore, F. B., 151, 227.
 Morgan, J., 228.
 Nunn, R., 228.
 Paes de Carvalho Sobrinho, D. J., 715.
 Parmalee, W. W., 879.
 Pyle, W. L., 947.
 Rohmer, J., 479.
 Saenger, A., 638.
 Sawyer, A. D., 715.
 Schalck, E., 559.
 Schneider, E., 947.
 Stuart, C. C., 559.
 Stevens, G. T., 319, 552.
 Szily, A. v., 230.
 Thomas, C. H., 718.
 Ulbrich, H., 319.
 Decentering of lenses, 470.
 Dermoid, 44, (694).
 Detachment of retina, (535), (619), (668), (711), 803, (864).
 Deviation of head, (282).
 Diabetes, (536).
 Diathermia, (877).
 Diphtheria, 915.
 Diplopia, (308), (310), (673), 696.
 Dislocation of lens, (59), (217), (290), (380), (534), (537), 601, 605.
 Divergence, (523).
 Drugs, action on iris, 450.
 Dyschromatopsia, (526).
 Ectasia, 674.
 Ectropion, (541).
 Edema, (467).
 Editorials—
 Accommodation with Aphakia, 296.
 A Great Meeting, 893.
 America's Welcome to Ophthalmic Visitors, 547.
 Asthenopia, 218.
 Cancer Involving the Eye, 53.
 Classification of Cataracts, 140.
 Decentering of Correcting Lenses, 470.
 Detail in Therapeutic Measures, 381.
 Differential Diagnosis of Conjunctival Folliculosis and Trachoma, 141.
 Examinations in Qualifications in Special Practice, 55.
 Fifty Thousand Cataract Operations, 631.
 Fundus photography, 935.
 Graduate Work of the American Academy of Ophthalmology and Oto-Laryngology, 298.
 Hysteric Blindness, 629.
 International Ophthalmological Congress, 142, 229, 383, 783.
 Journal Changes, 56.
 Letters for Subjective Testing of Refraction, 872.
 Meetings for 1921, 299.
 Missing Numbers, 57.
 Monocular Diplopia, 697.
 Over Treatment, 781.
 Papers for the Washington Congress, 383.
 Photoelectric Currents in the Eye, 548.
 Presidency of the A. M. A., 632, 937.
 Size of Ocular Fundus Details, 220.
 Surgical Asepsis in Ophthalmic Operations, 699.
 Trifocal Lenses, 471.
 The Year 1921, 937.
 Which Landolt, 143.
 Education, 38, 298, 674, (716), 939.
 Encephalitis lethargica, (477), 580, (592).
 Encephalocele, 850.
 Entropion, (282), (616).
 Enucleation and cranial development, 270.
 Epilepsy, (678).
 Epithelioma, (291), (379), 520.

Examinations, American Board, (51), (53), (63).
 Exophthalmos, (284), (688).
 pulsating, 124, 203.
 traumatic, (525).
 Externus, absence of, 523.
 Eyeball, luxation of, (871).
 rupture of, (526).
 Eyestrain and functional disorders, 438.
 Facial nerve blocking of, 445.
 hypertrophy of, (466).
 Fatigue, ocular, 119, (133).
 Fibroma, (525).
 Field of vision, (28), (31), (73), (78), (209), (611), 884.
 Fluorescein, (47), (303), (694).
 Fluoroscopy, 123.
 Focal adjustment of aphakia, 258.
 infection, (293), 356.
 Foreign bodies, (123), (205), (229),—(369), (371), (372), 605, (687), (869), 334.
 localization of, (205), 422.
 pseudo, (625).
 Fovea of birds, (714).
 Fundus photography of, 935.
 size of, 220.
 Gassing, (315).
 General diseases and eyestrain, 438.
 Glasses, (705).
 tinted, 644.
 See also Lenses.
 Glaucoma, (47), (48), (109), (313), (318), (380), (417), (619).
 and cataract, 424, (536).
 chronic, (215), (617).
 hemorrhagic, (155), (308), (869).
 infantile, (525).
 rainbow vision in, (712).
 traumatic, (619).
 treatment of, (318), 358, (371), (621), 889.
 Glioma, brain, (277).
 orbital, 641.
 retinal, (459).
 Goggles, (46).
 Gonoblenorrhœa, 944.
 Grafts, (438), (486), (625).
 Gullstrand lamp, (171), 427.
 Hemangiosarcoma, 91.
 Hemianopsia, (397), (556), (869).
 Hemorrhage, (228).
 choroidal, (216).
 in myopia, (46).
 retinal, (47), (214), (238), (284).
 Heredity, (307), 654.
 Herpes zoster, 853, (860).
 Heterophoria, (229), (390).
 History, (397).
 Hole at macula, (625).
 Holocain, (695).
 Horses, ophthalmia in, 330.
 Hospitals, 152.
 Hyalitis, (155), (619).
 Hyaloid remains, (625).
 Hygiene, (474).
 Hypermetropia, 436.
 Hyperphoria, frame for, (294).
 Hypopyon, (213).
 Hysteria, (238), (310), 629, (633).
 Illumination, 22, (72).
 Imamikol, (309).
 Infection, (47), (293), 356, (461), (477), (517), 881.
 Injuries, (48), (123), (215), (334), 336, 442, (537), (623), (694).
 and tetanus, 858.
 brain, 819.
 from ammonia, (210).
 from burns, (210), (215), (460).
 from button, 917.
 from contusion, 91, (311), (318).
 from explosion, (626).
 from gas, (315).
 from iron, (229).
 from lashes, (607).
 from steel, (49), (367), (380), (524), (928).
 from water glass, (215).
 head, (458).
 industrial, (474), 833, (862).
 perforating, (127), (370), (460), (540), 917.
 self inflicted, 345.
 to choroid, (283).
 to cornea, (292), (869), 917.
 to iris, (462), (869).
 to optic nerve, (67).
 to orbit, (924).
 X-ray, (638).
 Instruments, (43), (202), (367), (468).
 Intracapsular extraction, (47), 543, (595), 900.
 Iodin, 604, 917.
 Iodoform, (307).
 Ion zinc, (477).
 Iridectomy, (371), (540), (621).
 Iridocyclitis, (49), (213), (290), (379), (619), (689), 906, (926).
 tuberculous, (461), (927).
 Iridoplegia, (928).
 Iridotomy, 889.
 Iris, action of drugs on, 450.
 adhesions of, 446, (617).
 atrophy of, (478).
 coloboma of, (57), (282).
 dilatation of, (709).
 Iritis, 194, (284), (928).
 syphilitic, (713).
 tuberculous, (461).
 Irrigation, (944).
 Keratitis disciform, (212), (378), (573), 801.
 interstitial, (283), (549).
 marginal, (304), (371), 518.
 nodular, (923).
 parenchymatous, (302), (304).
 sclerosing, (529), (541), (620), (870).
 superficial linear, (304).
 zonular, (524).
 Keratoconus, (211).
 Keratomalacia, (279).
 Keratoplasty, 895.
 Keratosis, (69).
 Knife, magnetized, 605.
 Lacrimal apparatus, (32).
 anatomy of, (683).
 atresia, (685).
 canal, (609).
 concretions, (624).
 drainage, 197, (207).
 gland dislocation, (295).
 obstruction, 448, (532), 597, (685).

Lamina cribrosa, (236).
 Lamp, slit, (171), (287), 427.
 Lashes, (607).
 Lenses, decentering of, 470.
 distance, (706).
 protective, 644.
 tinted, 644.
 trifocal, 401, 470.
 ultifo, (923).
 Lenticonus, (284).
 Leontiasis, (293).
 Leproma, (304).
 Leprosy, (294).
 Leptothrix, 1.
 Lids, (273), (867).
 Light sense, (861).
 therapy, (877).
 Localization, (205), (422).
 Loupe, (468).
 Lues, (302), (713).
 Macula, 220, (714).
 hole at, (625).
 tuberculosis of, (50).
 Magnet extraction, (49), (462).
 Masques, eyes of, (46).
 Massage, (447), (617).
 Maxillary sinus, (943).
 Measles, 914.
 Meibomian glands, 1, 489.
 Meibomitis, 566.
 Melanosarcoma, (49).
 Meningismus, (944).
 Meningitis, (16).
 Meningoencephalocele, (47).
 Mercurochrome, (695).
 Mercury, (685).
 Metastatic infiltration of cornea, (407).
 sarcoma, (607).
 Methyl alcohol, 277, (316).
 Microscopy, 16, 171, (287), (388), 427.
 Microphthalmia, 850.
 Miotics, (304).
 Modeling, (280).
 Mucocele, (46).
 Mumps, 915.
 Mydriatics, (304).
 Myopia, (43), (46), (314), 363, 833.
 congenital, (393), (555).
 in semidarkness, (609).
 traumatic, (557).
 Nasal canal and race, 32.
 disease, 513.
 Neuralgia, 123.
 Neurology and the eye, (847).
 Neuroretinitis, (215), (291), 365.
 News items, 71, 151, 239, 318, 398, 479, 558,
 639, 715, 879, 947.
 Nizin, 694.
 Nursing, 550.
 Nystagmus, (149), 673, 942.
 Occlusion, 238.
 Ocular muscles, (704).
 balance, (238).
 operations on, (407), (708), (806), 838.
 Oculomotor nucleus, (475).
 Onchocercosis, (175).
 Operations, (47), (281), (327), (549), (859),
 (871).
 asepsis in, 699.
 Barraquer's, 595.
 Currán's, 889.
 delayed healing in, 516.
 lacrimal, 448, (532), 597.
 lid, (867).
 Maxwell, (687).
 muscle, (407), (708), (806), 838.
 Smith-Indian, 47, 543, 595, 900, (929).
 Wharton-Jones, (841).
 Ophthalmia, periodic in horses, 330.
 Ophthalmologists, preparation of, 38, (135),
 (647).
 welcome to, 547.
 Ophthalmology, graduate teaching of, (135)
 prize in, 232.
 tropical, 222.
 Ophthalmomyiasis, (69).
 Ophthalmoscopy, (171), (220), 427, 938.
 Optic disc, choked, (525).
 cupping of, (365).
 swelling of, (626).
 Optic nerve and chiasm, (451).
 atrophy of, (293), (307), 347, (459), (526),
 (537).
 avulsion of, (67), (713).
 coloboma, of, (921).
 excavation of, (307).
 tuberculosis of, (307).
 Optic neuritis, (215), (291).
 Optic pathways, (313).
 Optical glass, (72).
 tinted, 644, (922).
 Optician, (877).
 Orbit, shape of, (863).
 tumor of, (44), (127), (250), (681).
 Orbital mucocele, (46).
 phlegmon, (317).
 Panophthalmitis, 917, 919.
 Papillitis, 277.
 Papilloma, 91, 718.
 Paracentesis, (70).
 Paralysis, 123, 523, (612), (622).
 abducens, (462).
 accommodation, (43).
 convergence, (856).
 Parasites, (67), (69), (175), (397).
 Parenteral injections, 18, (47).
 Parotid swelling, (676).
 Peking Union Medical College, 940.
 Pensions, (152).
 Perimeter, illuminated, (366), (924).
 Perimetry, 28, (66).
 Phacoeritis, (46).
 Phlegmon, (317), 881.
 Phlyctenules in limbus, (612).
 Photoelectric currents, (548).
 Pituitary body, (209).
 tumor, 835.
 Polioencephalitis, (373).
 Polycoria, (64).
 Postoperative infection, 881.
 Pregnancy, (525).
 Precipitin reaction in lens, 909.
 Presidency of A. M. A. 632, 937.
 Prisms, (537), (626).

Protective lenses, 644, (922).
 Protein in lacrimal secretion, 647.
 Proteolytic ferments, 941.
 Prothesis, (280), (467).
 lid, (46).
 orbit, 481, (542).
 Pseudopterygium, (304).
 Pterygium, (525).
 Ptosis, (273), (458), (525), 657, (687), (867).
 Pulse, (536).
 Pupil in health, (375).
 membrane, (216), (676).
 pigment in, (279).
 reflex, (526), (588).
 Quack court, (677).
 Quinin, 68, (558).
 Radiant energy, (634), (636).
 Radium, 9, 91, (127), 427, 641, (710).
 Refraction, (48), (68), 671, (676), (682), (872).
 Resorcin, (694).
 Retina, anomalies of, (202), (233).
 cyst of, (297).
 detachment of, (553), (619), (688), 803, (864).
 miliary aneurysm of, (306).
 pigment in, (46).
 rupture of, (283).
 Retinal, adaptation, (557).
 angiomatosis, (151).
 angiосclerosis, 810.
 artery, 188, 202, (315), (503), (944).
 circulation, 188.
 degeneration, (306), (495).
 embolism (944).
 hemorrhage, (47), (214), (283), (284).
 image, (148).
 lesions, measurement of, (28).
 tension, (557), (558).
 thrombosis, 188.
 tuberculosis, (50).
 tumors, (457).
 vessels, 188, (288).
 Retinitis, cardiovascular, 495.
 central, (309), (923).
 circinate, 719.
 diabetic, (536).
 exudative, (607), (923).
 familial, (525).
 of pregnancy, (525).
 proliferans, (558).
 solar, (314).
 syphilitic, (539).
 Retinoscope, (283), 361.
 Roentgen rays, (638).
 Rupture of eyeball, (526).
 of choroid, (283), (929).
 of internal carotid, 356.
 of lens capsule, (377).
 of retina, (283).
 Salvarsan, 365.
 Sarcoma, 91, (127), (309), (607).
 Scarlet fever, 914.
 Schlemm's canal, 321.
 Scholarship fund, 716.
 Sclera resection of, (535).
 Scleritis, (305).
 Sclerochoroiditis, (711).
 Sclerosis, (862).
 Sclerostomy, (469).
 Sclerotome, 202.
 Sclerotomy, (380), (468).
 Scotoma, (310), (314), 664.
 Scotometer, (294), 314, (468), 521.
 Serology, 2.
 Shot wounds, 91, (536), 884.
 Siderosis, (280), 561.
 Simulation, (396).
 Sinus disease, 16, (291), (451), (461), 506, (711).
 Skull and orbit, (863).
 Smallpox, 573.
 Smears, 1.
 Smith-Indian Operation, (47), 543, (595), 900, (929).
 Societies Ophthalmological—
 American, 384.
 American Academy of Ophthalmology and Oto-Laryngology, 383.
 Belgian, 46, 279, 757.
 Buffalo, 283, 526, 625, 694.
 Chicago, 285, 372, 462, 549, 688, 929.
 College of Physicians of Philadelphia, 127, 385, 451, 543, 622, 683, 864, 921.
 Colorado, 48, 212, 290, 377, 460, 539, 681, 926.
 Colorado Congress, 133.
 Memphis 282, 371, 458, 779, 864.
 Netherlands, 607, 759, 853.
 New South Wales, 616, 774.
 Omaha and Council Bluffs, 295, 459, 537.
 Pittsburgh, 207.
 Puget Sound, 617.
 St Louis, 205, 774.
 Section on Ophthalmology, A. M. A., 51.
 Section on Ophthalmology, Royal Society Medicine, 239, 367, 467, 612, 772.
 Societe d'Ophthalmologie, de Paris, 525.
 United Kingdom, 473, 675.
 Wills Hospital, 369, 524.
 Socket development of, (863).
 restoration of, 481, (542).
 Sodium glycocolat, (310).
 Spectacles for infants, (687).
 Standardization of examining boards (61).
 Staphyloma, (539).
 Stereoscopic pictures, (226).
 Strabismus, (281), (679), (680), (704), (870).
 divergent, (529).
 treatment of, 407, 658, 608.
 Suction pump massage, 447, (617).
 Sympathetic ophthalmitis, (306), (396).
 system, (384).
 Syphilis, 195, (288), (309), (539), (713), 833.
 Tarsus, (107).
 Tay-Sachs' Disease, (535).
 Tenonitis, (46).
 Tenotomy, 806, (867).
 Tension, (47), (280), (315), (317), 365, 500, (554).
 Test card, 604, 872.
 Testicular extract, (279).
 Tetanus and injury, (858).

Therapeutics, 381, (694), (701).
 Thermophore, 109, (459).
 Thrombosis, retinal, 188.
 sinus, 16, 868.
 Tinted optical glass, 644, (922).
 Tonometer, 365.
 Torsion, (677).
 Toxic amblyopias, alcohol, 854.
 beri beri, (309).
 carbon monoxid, (73), (127).
 iodoform, (307).
 methyl alcohol, (277), (316).
 quinin, (68), (558).
 sea weed, (308).
 snuff, 854.
 Trachoma, 107, (141), 200, (308) (393), (608), 918.
 monocular, 851.
 Training of hands, 44, (388).
 Trichromycetes, 1.
 Trifocal lenses, 401, 470.
 Tuberculosis, (719).
 and operation, 516.
 iris, (461).
 optic nerve, (307).
 retinal, (50).
 Tuberculin, (927).
 Tumors, 91, (101).
 anterior chamber, (607).
 brain, (277), (682).
 choroid, (677).
 cornea, (304), 520.
 intraocular, (317), (609).
 lids, 9, (250), (291), (309), (372), (616),
 orbit, (44), (127), (250), (681).
 optic nerve, (260).
 pituitary, 853.
 pseudo, (308), (713).
 retinal, (459).
 treatment of, 9, 91, (127), 427, 641, (710).
 Ulcer, corneal, (46), (47), (460), 604, (688), (708), 917.
 Ultraviolet light, (309).
 Urotropin, (311), (696).
 Uveitis, (48), (213), (290), (379), (619), (688), (689), (690), 906, (926).
 Vaccines, (477).
 Variola, 854.
 Vision, acuteness of, (678), (862).
 changes in with posture, (679).
 in epilepsy, (678).
 psychology of, (678).
 rainbow in glaucoma, (712).
 Visual fatigue, 199, (133).
 fields, (28), (31), (73), (78), (209), (611), 884, (925), (926).
 perception, (678).
 Vitreous opacity, (624), (868), 906.
 prevention of loss, (610).
 War injury, 91, (315), (536).
 Wassermann reaction, (280).
 Water glass injury, (215).
 Wharton-Jones operation, (841).
 Whooping cough, 915.
 Xeroderma pigmentosa, (317).
 Yellow spot, (558).
 Zinc ion, (477).
 Zoster herpes, 853, (860).

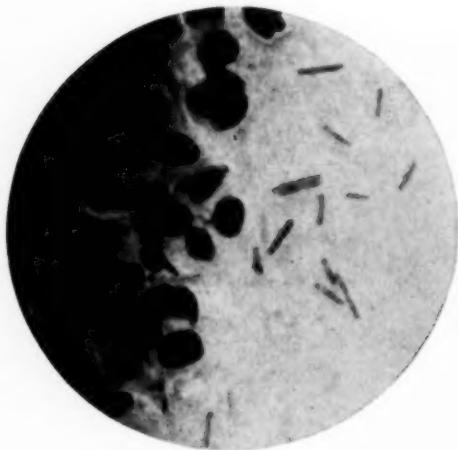


FIG. 1.—SMEAR OF CONJUNCTIVAL SAC. X 1200 (CASE 1)



FIG. 2.—SMEAR OF AGAR CULTURE. X 1200 (CASE 1)



FIG. 3.—SMEAR OF AGAR CULTURE SHOWING SPORES IN THREADS. X 1200 (CASE 1)



FIG. 4.—FOUR-DAY AGAR CULTURE. (CASE 1)

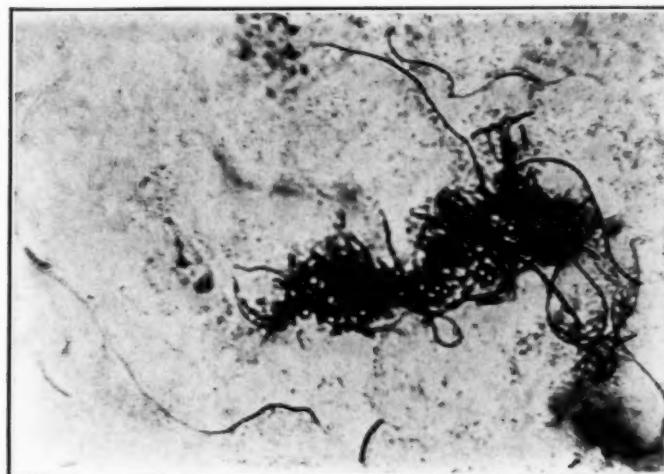


FIG. 5.—SMEAR OF 48-HOUR CULTURE. (CASE 2)



FIG. 6.—SMEAR OF MEIBOMIAN SECRETION
X 1200. (CASE 3)



FIG. 7.—SMEAR OF MEIBOMIAN SECRETION
SHOWING SPORES. X 1200 (CASE 3)

LEPTOTHRIX IN OPHTHALMOLOGY (S. R. GIFFORD)

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TRICHOMYCETES IN OPHTHALMOLOGY. I. LEPTOTHRIX.

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This paper reports work done in the Department of Bacteriology and Pathology in the University of Nebraska. It deals with the findings in three cases of conjunctivitis and involvement of the Meibomian glands. It also reviews the literature referring to this subject; and tabulates the characteristics of the organisms found by different authors. A detailed bacteriologic report with more complete discussion of the literature and bibliography has been published in the Journal of Infectious Diseases, October, 1920.

To most ophthalmologists, the name Leptothrix suggests the question, once a good deal argued, of the cause of lacrimal concretions. It is not with this question, however, that the present author is mainly concerned. He wishes to record his observations during the past year, of Leptothrix in two, and probably three, cases of other ocular conditions.

CASE 1. Helen N., aged 22, had been suffering with recurrent attacks of conjunctivitis in both eyes for over a year, becoming more frequent till she came in for treatment. Her present acute attack started a week ago, with pain, redness and slight discharge from the right eye.

When first seen, vision was 20/15 in each eye. Right eye presented a fairly severe conjunctivitis, with marked periorbital congestion, and marked congestion of the bulbar conjunctiva and of the lid borders, extending back along the Meibomian glands. There was some sticky secretion in the lower fold, which was thickened and hyperemic, but with no distinct nodules. The upper tarsus and fold were smooth and only slightly congested. The preauricular glands were not palpably enlarged. Left eye showed blepharitis, less marked than in right eye, and slight hyperemia of the lower fold.

What made this appear somewhat different from the usual case of conjunctivitis was the marked involvement of the bulbar conjunctiva and the inflammation along the Meibomian glands. A small amount of secretion was squeezed

out of these glands in both eyes. Smears and cultures of this were made, and of the secretion in the lower fold.

A zinc collyrium and yellow oxid of mercury ointment were prescribed, and the patient allowed to return to her home in the country. After five weeks she writes that both eyes are quiet, with no more discharge.

Smears of the secretion in the lower right fold showed numerous Gram-positive thread-like organisms, many 10-15 μ long, by 1-1 $\frac{1}{4}$ μ thick. Some were curved, and many presented clear, refractile, subterminal bodies which appeared to be spores. (See Fig. 1, Plate I). The organisms were all extracellular. Smears from the Meibomian glands showed no organisms.

Cultures on blood serum from the right lower fold showed in 24 hours a pure culture of a Gram-positive organism appearing as long, unbranched, curved threads, with some shorter rods. All forms were nonmotile. In cultures a few days old, coils of the thread-like organisms were found 50-100 μ long. Spores were formed after 48 hours, seen subterminally on the rods and all along the threads, and taking Moeller's spore stain. Free spores were numerous in older cultures. Nothing resembling branching was ever observed. The serum was liquefied after 7-10 days. (See Figs. 2, 3, 4, Plate I.)

Subcultures grew aerobically on all the ordinary media, freely at 37 C., slightly at room temperature. Anaero-

bically, it grew slightly or not at all. Subcultures from single colonies on a plate showed rods, long threads and spores. The most characteristic growth was in broth. The broth remained clear, with no pellicle, while a feathery clump of growth collected slowly at the bottom, sending upwards long threads which almost reached the surface after ten days or more. Gelatin was liquefied slowly at room temperature. No odor ever developed. The iodin reaction was negative in all media.

Resistance to heat: Cultures left in the boiling water bath for one hour were still viable.

Pathogenicity: The organism proved markedly pathogenic for guinea-pigs, not at all for rabbits or white mice. Guinea-pigs injected intraperitoneally and subconjunctivally with 5 and 2 m. of suspended organisms died within 24 hours. A guinea-pig received 2 drops of peritoneal fluid from the first guinea-pig in his conjunctival sac, and the conjunctiva was deeply scarified, death following in about 12 hours, with little local reaction, but signs of general infection. Smears and cultures at autopsy revealed pure cultures of the thread-like organism, except in G. P. III, where staphylococci were also obtained. In G. P. II, a pure culture was obtained from the heart's blood.

Attempts to produce conjunctivitis in animals were unsuccessful. Of two inoculations with loopfuls of growth in my own conjunctival sac, the first produced lacrimation and irritation lasting 24 hours, perhaps from the foreign material. The second was without effect.

Serology: Attempts to demonstrate toxin formation by injecting in a guinea-pig the clear fluid from a 10-day broth culture passed thru a Chamberlain filter were unsuccessful.

Two rabbits were successfully immunized by increasing intravenous doses, their sera agglutinating the organism strongly in dilutions of 1:160 and 1:320 respectively, controls being negative in normal salt, normal rabbit and normal human serum. Neither serum agglutinated the *Leptothrix* isolated from Case II in any dilution.

In this case, tho no organisms were found in the Meibomian glands, their state of inflammation, with the history of recurring attacks, suggested that the organisms might have harbored in these glands, enough of them escaping from time to time to cause conjunctivitis. It seems probable that a more careful search would have revealed them in the glands.

CASE 2. Mr. H., a man of 27, complained of symptoms suggesting eye-strain for the past year. He was found to have a slight refractive error, but the congestion of his conjunctiva, especially on the tarsi along the Meibomian glands, combined with a small amount of sticky secretion in the sac, seemed to indicate another factor to account for his symptoms. No organisms were found in the smears of the conjunctival secretion. Pressure on the Meibomian glands expressed an excess of whitish, waxy, semi-fluid material from all their orifices. A zinc collyrium was prescribed, and the symptoms were relieved for a time, but in two weeks he returned with the same trouble. A correction for reading was given, and his glands were thoroly squeezed out. This was repeated in six weeks, when there was still an excess of fluid, tho symptoms were slight, and the congestion much less. The patient was told to return for squeezing out whenever symptoms returned, but has not been heard from.

BACTERIOLOGIC FINDINGS: Smears of the Meibomian secretion showed a fair number of large rods with rounded ends. There were no true threads, but some of the bacilli were as long as a *hypsobacillus*, and all seemed too thick for *B. Xerosis*. Both Gram-negative and Gram-positive forms were seen.

Cultures: Broth culture showed, besides staphylococci and *Xerosis* bacilli, a predominance of long organisms, some 10-12 μ long and often curved. A pure culture of this was obtained from a single colony on a plate and proved to be somewhat similar to the organism of Case 1. It formed threads 20-50 μ long, never branching, and formed true spores. It grew much more delicately, however, at 37° C., and not at all at room temperature, formed fewer spores,

and the threads never grew as long as those of the first organism. It proved nonpathogenic for animals, and, as mentioned above, showed no relation serologically with that organism. (See Fig. 5, Plate II.)

Whether the large bacilli in the smears were the same organism isolated in culture is questionable. The thread-formation in culture, however, was not marked till after 2-4 days, so it is quite possible that the organism might form few or no threads on its human host, and still form them in media which favored complete development. The organism in cultures, at any rate, is seen by its unbranched thread-formation to be a Leptothrix, and whether a pathogenic agent or not in this case, at least an inhabitant of the Meibomian glands.

CASE 3. Mr. F., aged 60, complained of a burning sensation and tired feeling in his eyes for over a year. Vision was brought up to 20/20 with suitable correction. Both eyes were inflamed, with lids thickened and reddened at the ciliary margin. On squeezing the lids, a large amount of semitransparent, honey-like fluid was expressed from most of the Meibomian glands. As the patient was obliged to return home at once, the expression was made as complete as possible, zinc chlorid one grain to the ounce was prescribed, with zinc cerat ointment for the lids; and the family doctor was instructed by letter how to express the lids twice a week. A letter two months later reports no further symptoms while the treatment is continued.

Smears: One smear of the material from the glands showed a large clump consisting of curved, Gram-positive threads, with shorter Gram-positive rods, some of which were curved. (See Figs. 6 and 7, Plate II.) No branching was seen. A few Gram-positive threads were seen in other smears, with a few Gram-positive diplococci. It seemed as if a small lump or concretion of the thread-like organisms had been broken up on the first smear, while no other such concretions had been obtained on the others. An aerobic culture on blood-serum was the only one taken, and this showed only staphylococci and Xerosis bacilli.

From smears alone, a positive diagno-

sis between Leptothrix and Streptothrix can hardly be made, since it is known that Streptothrix may show notable branching only in culture. The threads were $1-1\frac{1}{4}\mu$ wide, however, about twice as wide as the threads of most Streptothrixes, and showed refractile, spore-like bodies, similar to those seen in the smears of Case 1 (See Figs. 1, 2 and 3), so that the diagnosis of Leptothrix may be considered the most probable.

LITERATURE.

Probably the most satisfactory classification of the higher fungi is that of Petruschky (1), who divides them into true molds and Trichomycetes, including in the latter as four distinct groups Leptothrix, Cladotrichix, Streptothrix, and Actinomyces. The Leptothrix group is characterized by the formation of threads with neither true nor false branching. The iodin reaction may be considered of no value, as Fricker (2) and others have shown that it is due to the presence of starch granules, which depends on the previous nutriment of the organism.

The occurrence of Leptothrix in the body as a saprophyte has been well-known since Bizzozero (3) in 1884 described Leptothrix Epidermidis as a constant finding on the normal skin; and Miller (4) distinguished four types of Leptothrix (Buccalis) in the normal mouth.

It has been described as a pathogenic organism in lesions of various regions. In mycoses of the mouth, especially of the tonsils, Michelson, Fraenkel, Chiari, Stoops, Dubler, Hering, Epstein, Wright, Newcomb and others have found Leptothrix in smears or sections.

Leyden and Jaffé found it in putrid bronchitis and Pearce found it in necrosis of the larynx and esophagus. v. Arx found it in two cases of phlegmon of the neck; v. Herff describes vaginitis which he attributed to Leptothrix. Leber (5) repeatedly inoculated rabbits' corneas with fresh material from the tonsils containing Leptothrix, and produced progressive lesions of the cornea, sections of which showed Leptothrix elements. He appears never to have been working with pure cultures. Bjeloff,

(quoted by Jacobsen) in a case of pyemia, found masses of threads resembling *Leptothrix* in the vessels of the liver at postmortem. If this organism were really *Leptothrix*, its occurrence is interesting, as indicating that the organism may rarely assume extremely pathogenic properties.

The large number of concretions of the canaliculi purporting to be caused by *Leptothrix* are of especial interest to ophthalmologists. Fifteen observers of such concretions have reported *Leptothrix* as the causative organism. They are: v. Graefe (10 cases), Narkiewicz-Jodko (2 cases), Haase, Bajardi, Hirschberg, Segelken, Cannas, Schirmer, Foerster, del Monte, Cappellini, Higgins, Bugier, Casumet and Hirschler. The same objection applies to nearly all of these reports, that no cultures were obtained. Many of the observations were made, in fact, at a time when there was no question of distinction between branched and unbranched forms, any thread-like organism being called *Leptothrix*, after von Graefe. Segelken, Hirschberg, and others, however, noted complete absence of branching in their smears, and thought this, with their failure to grow in culture, argued for *Leptothrix*. Cannas' case (6) was the only one in which culture was successful, and this, under somewhat doubtful conditions. In a mixed culture one colony was found which, on being transferred, gave a pure growth of branched threads. This was evidently *Leptothrix*, but Axenfeld (7) considers it doubtful if it was the responsible organism.

Cannas and Bajardi believe that *Leptothrix*, *Streptothrix* Foersteri, and *Actinomyces* may each cause lacrimal concretions. Majocchi, studying a series of concretions of the salivary ducts, came to the same conclusion for these concretions. As Axenfeld has pointed out, however, some of the concretions which gave a *Streptothrix* on culture showed very slight branching in the smears, and since only the one somewhat doubtful culture of *Leptothrix* was obtained from a concretion, he is probably justified in concluding that *Leptothrix* as a cause of lacrimal concretions occurs but rarely. Harman (16) in cultures of

one hundred conjunctivae of healthy school children reports in his table *Leptothrix Buccalis* as having been found twice, but gives no further details. It was evidently in mixed culture.

In recent years Verhoeff and Derby (8) have found a peculiar thread-like organism in sections of excised conjunctiva and lymph nodes from cases of Parinaud's conjunctivitis. By a special staining method, they have shown in eleven out of twelve cases masses of threads and granules in necrotic areas in the tissues. The threads were $3-10 \mu$ long in sections, but in teased preparations could be found as 30μ . They were unbranched and called by the authors *Leptothrix*. Keiper (9) since their report, obtained sections in which one pathologist claimed to have found such threads, but neither Verhoeff nor Warthin and Novy, to whom the material was submitted, could concur in this finding. Since, so far as I am aware, no culture has been obtained, it seems that the diagnosis of *Leptothrix*, as in the case of concretions, must remain somewhat questionable.

The only description of *Leptothrix* infection of the globe which I have found is that of Sorokin (17). This author, in a case of panophthalmitis developing after extraction, found the affected parts of the cornea covered with small white masses which proved to be clumps of unbranched threads. No other organisms were found. While no pure cultures were obtained, pieces of cornea in various media were studied at frequent intervals, for four days, so that a fairly reliable idea of its growth and morphology was obtained. In drops of human blood on potato especially, growth could be followed for four days, when it died out or was overgrown with contaminants. The threads increased in length, developed septa which marked the site of the division into smaller threads. These remained always unbranched. No spores were observed. The author thinks his organism a form distinct from *Leptothrix buccalis* and suggests the name *Leptothrix oculorum* mihi.

From a bacteriologic point of view, the few cases where pure cultures of *Leptothrix* have been obtained are of

more interest. Besides the case of Cannas, I have found but two, possibly three, observers who have definitely isolated Leptothrix from lesions, and three from normal tissues, with some more doubtful cases. Arustamow (10) isolated two types, an anaerobic strain from the urine of a tabetic, and two aerobic strains from the tonsillar crypts in cases of tonsillitis. Cozzolino (11) obtained thirty pure cultures from the different organs at autopsy from a young girl who died with retropharyngeal abscess and symptoms of basilar meningitis following a periauricular swelling from which the same organisms were recovered. Pathogenicity was marked for guinea-pigs and house mice.

Vignal (12) in a series of plate cultures from the tartar of normal teeth isolated a slow-growing aerobic form of Leptothrix. Bordoni-Uffreduzzi (13), from the skin between the toes and in the groin of normal persons with intertrigo, isolated a *Bacillus Epidermidis* which they say is identical with the *Leptothrix Epidermidis* described in smears by Bizzozero. Lehmann and Neumann (14) evidently grew a similar organism from the normal skin. The *Bacillus* (*Leptothrix?*) *Pyogenes Filiiformis* isolated by Flexner (15) from the viscera of a rabbit dying from infectious abortion, which grew only on tissue media, is probably a Leptothrix, tho it showed a formation of sheafs and rosettes which somewhat suggests *Cladotrichia*. All these organisms showed the unbranched thread-formation of Leptothrix.

Table I sums up their more important properties. Other organisms said to have been Leptothrix have shown some form of branching, or the data was too meagre to make a diagnosis at all certain. Jacobsen (18), from the tonsillar crypts of three cases, apparently obtained cultures of Leptothrix. Grown on potato at room temperature, it appeared as small colonies after three days, forming small depressions in the media, and later fusing to form a finely granular surface. No spores are described. He never worked with single colonies on plates, and Arustamow and others have questioned whether a pure culture was obtained. Since similar unbranched threads were

obtained in smears and cultures repeated in two of the cases, it seems to the author likely that a pure culture of Leptothrix was obtained.

SUMMARY: Table I shows more or less important cultural and morphologic differences between nearly all the strains isolated. It seems certain that the name Leptothrix concerns a complex group of organisms containing, as has been shown for the Streptothrices, several distinct species. The author's two strains showed many points of difference. There seems to be no definite biologic distinction between *Leptothrix Epidermidis* and *Leptothrix Buccalis*; and Miller's four groups of *Leptothrix Buccalis* are based on the unsatisfactory grounds of morphology and the iodin reaction.

In such a confusion of small differences, the property of spore-bearing seems to the author more definite than the others. His two strains, with those of Cozzolino and Bordoni-Uffreduzzi, showed definite spore-formation; while those of Flexner, Lehmann and Neumann, Vignal and Cannas formed no spores. In his previous article the author has suggested the possibility of placing the first mentioned organisms in a tentative group of *Leptothrix Sporogenes*, calling the others *Leptothrix Simplex*. As more pure cultures are reported, these groups will probably be found to contain several distinct species. It may be found, however, that all forms may produce spores under certain conditions.

There can be no doubt, in view of Cozzolino's findings, which are borne out by the author's and probably also by those of Flexner, that true Leptothrices can be distinctly pathogenic for man and animals. The author's finding Leptothrix in the ocular apparatus makes it more probable that some few cases of lacrimal concretions said to have been caused by Leptothrix were really caused by that organism, tho Streptothrix is undoubtedly much the more common agent. The source of Leptothrix in the conjunctival sac may be the mouth by means of a finger, or it may migrate occasionally from the skin of the lids to the Meibomian or other glands, and thence to the sac.

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TABLE I

| Author | Source | Gram-stain | Spore-formation | Oxygen Requirements | Motility | Lodin Reaction | Pigment-formation | Pathogenicity |
|--------------------------|---|------------|-----------------|---------------------|----------|--------------------------|-------------------|---|
| | | | | | | | | |
| Arusamoff I | Urine of a tabetic | *N.M. | Prob. + | N.M. | — | Anaerobe | — | Not tested |
| Arusamoff II (2 strains) | Tonsillar crypts in tonsillitis. | N.M. | Prob. + | N.M. | — | Aerobe | + | Not tested |
| Cozzolino | Periantricular abscess and viscera at post-mortem | + | + | N.M. | + | Aerobe | + | Positive for guinea-pigs, and house mice. Negative for rabbits and white mice |
| Vignal | Tartar of normal teeth | N.M. | — | N.M. | N.M. | Aerobe | + | Not tested |
| Bordoni-Uffreduzzi | Normal skin and skin in intertrigo | N.M. | + | N.M. | N.M. | Aerobe | — | Guinea-pigs and human skin |
| Lehmann and Neumann | Normal skin | + | — | — | + | Aerobe | + | Guinea-pigs and human skin |
| Flexner | Uterus and viscera of rabbit at postmortem | — | — | — | — | Aerobe (only on tissues) | — | Not tested |
| Canna | Concretion of canaliculus | + | — | — | + | N.M. | — | Positive for rabbits and guinea-pigs. Negative for mice, pigeons and dogs |
| Author I | Conjunctiva in recurring conjunctivitis | + | + | — | — | N.M. | — | Negative |
| Author II | Meibomian glands in chronic meibomitis | + | + | — | — | Aerobe | — | Positive; Guinea-pigs, white mice, author's conjunctiva |
| | | | | | | | | Negative; Guinea-pigs, and author's conjunctiva |

*N.M.—Not Mentioned.

CONCLUSIONS.

1. A strain of Leptothrix was found as the only organism in smears and cultures from the conjunctival sac in a case of recurrent conjunctivitis. It was pathogenic for guinea-pigs and showed definite spore-formation.

2. A Leptothrix was isolated from a case of chronic meibomitis. It showed definite spore-formation, but was non-pathogenic for guinea-pigs, serologically distinct from the first strain, and presented cultural differences from it.

3. What is probably a Leptothrix was

found in smears from a second case of chronic meibomitis. It apparently showed true spores.

4. The group of Leptothrices includes at least two, and probably more, distinct species.

The writer wishes to express his appreciation to Dr. J. T. Myers of the University of Nebraska, and to Dr. Ludwig Hektoen of the John McCormick Memorial Institute, for their kindness in going over his material with him, and to Dr. A. S. Rubnitz for translating the articles of Arustamow and Sorokin.

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CARCINOMA OF THE EYELIDS TREATED WITH RADIUM.

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Recently, there has been a great outpouring of reports on the treatment of skin carcinoma with radium. With few exceptions, these articles have omitted some important detail in the description of the lesion, or the technic of the radium application, which would

history) were made with silver tubes (0.2 to 0.3 mm. thick) enclosing glass capsules, containing approximately 25 or 50 mgm. of radium element as the radium barium sulphat. Also, unless otherwise specified, the surrounding tissue was protected with lead from



Fig. 1.—Case I before treatment, March, 1918.

seem to be essential, if they be published with the desire to be helpful.

At the risk of being somewhat tedious, we shall make this report cover eight cases of carcinomas about the eyelids, with clinical findings and complete details of the application of radi-

0.5 to 2. mm. thick and 0.5 to 1. mm. of gum rubber was interposed between the surface of the lesion and the radium applicators. In those cases where it was imperative to protect the globe and ocular conjunctiva from prolonged cautery radiation, we have made use



Fig. 2.—Case I July, 1920, more than two years after the last application of radium.

um. These eight cases will illustrate some of the usual and unusual features that we have met in a series numbering over 100 cases occurring about the eyes.

The clinical diagnosis of carcinoma was made, in all cases treated with radium, by the consultant staff of the Barnard Free Skin and Cancer Hospital.

In general, all applications of radium (unless otherwise stated in the case

of oval lead screens from 0.5 to 1 mm. thick which were fastened to fit the contour of the globe and to project downward and upward into the conjunctival fornices after the form of an artificial eye. These screens were dipped in melted paraffin to give them a smooth coat of nonconductive material. After instilling a few drops of liquid vaseline under the lids, they were inserted with only slight discomfort to the patient. In no case was it

necessary to use a local anesthetic for the introduction of these screens, and it was found that they were self retaining, if made properly. In one instance such an appliance, with radium fastened to it, was borne comfortably for 24 hours. (See Case No. VII.)

CASE I. W. H. Figure 1 shows the condition at the time of admission,

per square cm. of the surface area of the tumor.

CASE II. J. H. Figure 3 shows the condition on admission. The carcinoma involved the inner canthus of the left eye and the medial three-fourths of the ciliary margin of the upper lid. It was first noticed four years previously. There had been no treatment. The



Fig. 3.—Case II before treatment, November, 1918.

March, 1918. The carcinoma involved the inner two-thirds of the lower left eyelid. Duration 11 years. The only treatment had been given by the family physician who made applications with some caustic solution.

Radium 75 mgm. in silver tube appli-

growth was approximately $3\frac{1}{2}$ by $2\frac{1}{2}$ cm. and produced a thickening of the upper lid to 1 cm. There was a chronic purulent conjunctivitis.

Radium applications as follows: Nov. 27, 1918, 100 mgm. for 4 hours in silver tube applicators covered with .5 mm.



Fig. 4.—Result of treatment, remaining clinically cured after two years.

cators covered with 0.5 mm. of rubber was applied for four hours on March 11th, 1918. Again on April 7th, 1918, 50 mgm. was similarly applied. There was a complete retrogression of the tumor noted on June 13th, 1918. The scar was soft and pliable; the vision showed a slight improvement; there was no ectropion and aside from the loss of lashes, there was 100% efficiency of the eye. There has been no recurrence to date. Figure 2 taken July, 1920.

The total radium given was 500 milligram hours, averaging about 100 mg.h.

rubber. Jan. 6, 1919, 100 mgm. for 4 hours with same filter. Feb. 21, 1919, 25 mgm. for 4 hours similarly applied to persistent nodule at inner canthus.

Complete retrogression of the carcinoma and healing of the burn was noted on March 27th, 1919. The vision was not impaired. The patient has remained clinically cured to date. Aside from the loss of lashes of upper and lower lids, this case was a 100% efficient eye.

Total radium dosage 900 mg.h. or about 150 mg. h. per square cm. of tumor surface.

CASE III. C. H. Both photos are indistinct but one can see from figure 5 that the ulcerating carcinoma involved the outer angle of the left eye and the upper lid. The growth was roughly triangular, about 3 cm. on each side, and was firmly anchored to the superciliary ridge and the external angular process. There were early cataracts of both eyes.



Fig. 5.—Case III before applications of radium, December, 1919.

Surgically the growth could not have been removed properly without an enucleation.

Radium treatment was given Dec. 19, 1919, as follows: 100 mgm. for 6 hours with the silver tube applicators placed

protected in the vision or status of the cataract of the right eye.

The total radium dosage was 600 mg. h. or from 60 to 100 mg.h. per square cm. involved.

CASE IV. L. T. Figure 7 taken at the time of the radium treatment shows a carcinoma involving the outer one-half of left lower eyelid, and extending 2 cm.



Fig. 6.—Case III March, 1920, three months after one application.

on to the neighboring cheek. The mass was adherent to the infraorbital ridge in the scarring produced by two previous caustic treatments. The neighboring skin showed senile changes with a definite keratosis projecting from the lower



Fig. 7.—Case IV before radium treatment, March, 1918.

radially about the margin. The globe and surrounding tissue was protected with 1 mm. of lead.

This patient was not seen again until March 19th, 1920, at which time there was no evidence of the growth, aside from a soft pliable scar. There was no scar contracture. The vision was improved, and there was no evidence of the cataract of the left lens, which had been present at the time of the radium application, altho no change could be de-

tectioned in the vision or status of the cataract of the right eye. Two silver tube applicators, each containing 25 mgm. of radium were applied for 6 hours on March 4th, 1918. No protection was used for the globe in this case, and there resulted a very marked conjunctivitis with considerable edema of lower lid.

By April 9th, 1918, the lesion showed complete retrogression, but there was some ectropion of the lower lid. She was last seen April 1st, 1919. See Figure 8.

The total radium dosage was 300 mg. h. averaging 60-75 mg.h. per square cm. of surface involved. This is a low dosage, given on account of the scar.

CASE V. S. B. This carcinoma had been present for five years before entering our clinic. Four years ago, the growth was curetted and the base cau-

The nodule on the left side of the nose was given 25 mgm. for four hours thru a 6 mm. fenestrum in $\frac{1}{2}$ mm. lead.

This patient was next seen on December 4th, 1919. It was noted that there was no clinical evidence of the carcinoma or the pterygium, and he has re-



Fig. 8.—Case IV, one year after treatment.

terized. This treatment was repeated three months ago, since which time the carcinoma developed rapidly. Figure 9 shows the condition on admission. The bulk of the tumor was at the inner canthus with the ulceration extending 6 mm. along the conjunctival surface of the

mained well to date. Figure 10 was taken in July, 1920.

Radium dosage to canthus was 100 mg.h.

CASE VI. E. W. Figure 11 shows this "recurrent" carcinoma involving the entire right upper lid. Six months before

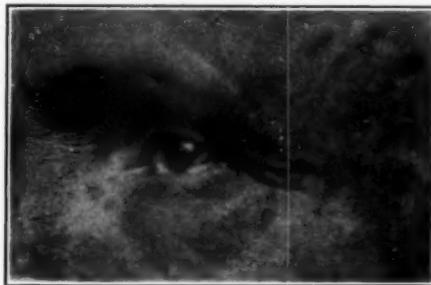


Fig. 9.—Case V, after repeated curetting before use of radium, October, 1919.

upper lid and 2 mm. along the lower lid margin. There was also a persistent nodule 4 mm. in diameter on the left side of the nose, a pterygium covered the medial quarter of the globe to the margin of the pupil. On October 17th, 1919, a 25 mgm. silver tube covered with 0.5 mm. paraffin was applied for four hours. The active end of the tube was in contact with the pterygium covering this portion of the globe. The scar tissue was protected with lead.



Fig. 10.—Case V, July, 1920, nine months after radium application.

admission the growth had been cauterized (actual cautery) with the apparent loss of substance from the ciliary margin thru the tarsal cartilage. This defect was partly filled with a projecting carcinomatous mass, which extended to both angles of the eye and upward for a distance of 6-7 mm.

He had five applications of radium as follows:

April 7, 1918, 25 mgm. for 4 hours equals 100 mg.h.

June 7, 1918, 25 mgm. for 2 hours equals 50 mg.h.

October 10, 1918, 25 mgm. for 3 hours equals 75 mg.h.

Dec. 9, 1918, 50 mgm. for 3 hours, silver brass 1 mm. Distance 5 mm.

Feb. 8, 1919, 50 mgm. for 18 hours, silver brass 1 mm. Distance 10 mm.

All clinical evidence of carcinoma was

inferior conjunctival sac. This tumor, with the scarring of the previous treatment, caused an eversion of the lower lid with epiphora. The mass was firmly adherent to the floor of the orbit. Its posterior limits could not be palpated as the ledge of induration projected under the globe.

It was thought advisable to enucleate



Fig. 11.—Case VI, carcinoma recurred after cauterization. Before use of radium, April, 1918.

gone April 3rd, 1919. Since this time he has remained well. Save for the loss of substance of the upper lid in the region of the punctum, and the loss of lashes, this patient has an efficient eye. Function is estimated at 85%.

It will be noticed that the initial dose of radium was too small in this case.

and cauterize the floor of the orbit; but with the patient's permission, and with the recommendation of the consulting ophthalmologist (Dr. A. E. Ewing), we made the following radium application. October 9th, 1919, 50 mgm. in silver and rubber for six hours applied outside the everted lid. 25 mgm. in silver tube sur-



Fig. 12.—Case VI, after five applications of radium, April, 1919.

CASE VII. C. R. Figure 13 shows a persistent carcinoma of the lower lid following its "cure" by the application of "cancer paste" four years previous to admission. At the time the paste was applied the lesion was 3 years old and was described as about the size of half a pea. This patient has had bilateral pterygia covering the medial quarters of both globes since childhood.

On admission the carcinoma presented as an oval mass, 3 cm. long within the

rounded by 1 mm. brass and 1 mm. rubber for 24 hours, applied directly over the mass where it projected against the globe, in the lower conjunctival fornix. The only protection afforded the sclera was 1 mm. of lead formed to the contour of the globe covered with 0.5 mm. of paraffin. This application was borne without local anesthetic. There was an acute conjunctivitis with marked edema during the radium reaction.

This patient was next seen January,

1920, at which time, there was moderate ectropion (no epiphora) but no other evidence of the carcinoma. He was last seen Oct. 15th, 1920. The pterygium, which disappeared after the radium treatment, had recurred; but did not cover more than one-half its former area. See Fig. 14.

CASE VIII. W. H. This is one of

the margin of the large carcinoma of the right temple. Two 25 mgm. tubes were packed against the tumor of the inner canthus for 3 hours. These tubes were placed at right angles to each other, crossing the lid margins at right angles and in actual contact with the conjunctiva of the globe, which had become involved.



Fig. 13.—Case VII, four years after use of cancer paste and before use of radium, October, 1919.

our examples of multiple carcinoma. As will be seen in Figure 15 taken July 19th, there occur great numbers of senile keratoses about the face. Many of these showed pearly rolled borders. Beside the large one at the right temple, there is a carcinoma involving the entire inner

The small carcinoma seen in Figure 15 on the upper lid near the outer angle was treated with a 25 mgm. tube for four hours.

No clinical evidence of carcinoma was present when the patient was last seen July, 1920, Figure 17. The center of the



Fig. 14.—Case VII, one year after use of radium, October, 1920.

right canthus, and encroaching 2-3 mm. on to the conjunctiva of the globe, also extending on to the nose. This growth had been treated with cancer paste nine months before admission. This caustic treatment had opened the upper nares in this region. (See Figure 16, which was taken August, 1919, during the healing of the radium reaction).

He has had radium as follows: July 10th, 1919, 100 mgm. for 33 hours, applied in rubber covered silver tubes about

large scar on the right temple showed some roughening and pigmentation. It was noted that the keratoses in the immediate vicinity of the lesions had disappeared, due to the incidental irradiation.

The radium dosage for the large carcinoma was calculated so as to give approximately 100 mg. h. per square cm. of involved tissue.

DISCUSSION.

Clinically these tumors are well known to be slow growing, pearly, rose colored,

smooth nodules, with semi-translucent appearance, tending to occur, singly or in multiple, at the site of some slight traumatism or infection in individuals, having senile, hyperkeratotic areas in the region of the lids. The lesions tend to appear

in diameter with a central crater of ulceration, covered by a hemorrhagic crust.

Pathologically these carcinomas of the lids are made up of basal cells, closely packed together with very little stroma. They show little or no infiltration or



Fig. 15.—Case VIII, multiple carcinoma, treated nine months with cancer paste, July, 1919. Before use of radium.

about the outer or inner canthus, at a little distance from the ciliary margin; very few nodules begin at the center of the lids. In about 15% of the cases there occurs more than one nodule.

tendency to metastasize. In other words, they are benign.

Surgically, growths of the lids are most difficult to deal with satisfactorily, as the removal of even small nodules



Fig. 16.—Case VIII, August, 1919. During healing of radium reaction.

Crater like ulceration is the rule by the time the lesion has attained a size of 5 to 6 mm., following which the growth becomes more rapid and the lesion increases markedly in thickness.

In many instances daughter nodules form about the margin so that the growth appears as a pink rosette of 2 to 3 cm.

often causes distortion of the marginal contour, and in those instances requiring the removal of over one-half the lid margin or either angle, there is little hope of restoring 100% function to that eye.

In speaking of inferior blepharoplasty, Major H. D. Gillies states in his work on "Plastic Surgery of the Face" that,

"where the loss of the lid edge is one-third or less, a very satisfactory repair can be made, but when the whole lid has been destroyed the operation results seen by the author are considerably wanting in finish." If this is true for the

first for radium rather than as a last resort. Much less favorable results were obtained in cases IV, V, VI, and VII on account of the presence of scar tissue, which is very easily broken down under irradiation leaving a tissue defect.



Fig. 17.—Case VIII, July, 1920.

repair of the lower lid in the hands of experts, then it must be almost impossible to supply a movable upper lid.

In general then, surgical procedures removing the greater portion of either lid sooner or later demand an enucleation to free the patient from the discomfort of infection and irritation of the exposed globe.

We have shown cases I, II, and III with markedly favorable results, cosmetically and physiologically, to illustrate what may be done if the growth comes

Attention is called to the fact that cataracts disappear with radium treatment; further, that cautery doses of radium are often of service in removing pterygia.

It has been observed that the sclera is particularly resistant to radium even in cautery doses, and that the conjunctiva reacts more quickly and is more rapid in its repair than the epithelium of the lids.

In general, then, with regard to the treatment of carcinomas about the eyelids, radium is the method of choice over any surgical procedure.

CAVERNOUS SINUS THROMBOSIS COMPLICATING MENINGITIS. MICROSCOPIC STUDIES.

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This is the report of a case which takes added significance from the careful autopsy and microscopic examination by which it is supplemented.

The patient was an Italian child, aged 3½ years, who was brought into the New Haven Hospital on May 12, 1920.

The family and past histories were negative.

The present illness began on May 10th, when the left eye became red and slightly swollen. The child complained of pain in the eye but played as usual. The following day the eye was worse, and he appeared ill, refusing to eat; and remained quiet all day. On the 12th of May the child's condition became alarming and a physician was called, who sent the child into the hospital.

The physical examination showed an irritable child with the left eyelids edematous and injected, the globe proptosed. The edema and redness extended up over the forehead and back to the ear. The conjunctiva was injected and there was a slight purulent discharge. The right eye was normal. The lobes of the ears showed some excoriation but no discharge from the middle ears. There was no nasal discharge. The neck was stiff and Kernig's sign was strongly positive on both sides. Otoscopic examination showed no perforation of the membranae tympanorum. Ophthalmoscopic examination was unsatisfactory, but no gross changes were noted. Temperature was 101.5°.

A lumbar puncture was made, the pressure being much above normal. The fluid was cloudy, and smears showed many pus cells, but no organisms. Smears from the left eye showed many organisms, but no intracellular diplococci.

The day after admission to the hospital, the general condition was unchanged; but the right eyelids were red and edematous. Lumbar punctures were made at 9 a. m. and 9 p. m. and at each

operation, 40 cc. of antimeningococcus serum was injected.

Blood examination gave 4,200,000 reds, 72% hemoglobin, and 18,000 white blood cells.

On the 3rd day after admission to the hospital the general condition became worse, and the proptosis of the eyeballs and edema of lids increased. The patient died at 11 p. m. and a partial autopsy was secured.

AUTOPSY. The brain at autopsy showed the right cerebral cortex covered over with a large blood clot and the vessels intensely injected. A small amount of purulent exudate was present along the vessels of the base of the cerebral hemispheres, and a definite purulent exudate was found over the dura of the middle fossa. The left lateral sinus showed a small thrombus, which had extended back into the straight sinus and into the posterior part of the longitudinal sinus. Both cavernous sinuses were filled with a thrombus.

Bacteriologic specimens were obtained from the heart blood, right and left orbits and the brain. The heart blood was sterile. Both orbital cultures showed staphylococcus aureus; and the right, in addition, streptococcus hemolyticus. The brain culture gave staphylococcus aureus and streptococcus hemolyticus. The cultures showed grampositive diplococci in chains, and grampositive staphylococci in groups. The organisms in chains produced hemolysis on blood agar plates.

Section thru posterior part of left orbit showed a thrombus filling the ophthalmic vein. The center of the thrombus had disintegrated and showed large numbers of polymorphonuclear cells. At the periphery the thrombus was intact and the fibrin strands were seen forming a dense meshwork. There were large

numbers of mononuclear cells and a few polymorphonuclear cells surrounding the vessels and extending in all directions into the surrounding tissue. In some places there were areas of necrosis.

Section thru the posterior part of right orbit showed there were similar areas of cellular infiltration around the vessels, and extending into the surrounding tissue. There was marked disintegration of the nuclei and many places showed large numbers of nuclear fragments. The cells were largely mononuclear but polymorphonuclear cells were seen also. There were some blue staining masses suggesting clumps of bacteria.

Sections thru the clot in the left cavernous sinus showed an early thrombus. The typical structure with platelet columns, etc., was not seen. The thrombus was homogeneous in appearance, showing a meshwork of fibrin strands with many mononuclear and polymorphonuclear cells scattered thruout. The tissue around the right cavernous sinus showed an infiltration of polymorphonuclear and mononuclear cells.

The left lateral sinus showed a thrombus similar to that described for the

cavernous sinus. In some places, however, there were the typical fibrin strands with accumulation of white blood cells in columns. There was also a dense accumulation of polymorphonuclear and mononuclear cells, which was in part surrounded by the intact thrombus.

A section thru the clot in the posterior part of the longitudinal sinus showed a thrombus resembling that described in the cavernous sinus.

The occipital sinus and left sinus rectus showed a postmortem clot.

A section of the dura from the left anterior fossa showed a slight purulent exudate on the surface.

There was a slight meningeal exudate consisting of serum, red blood cells, mononuclear cells, and some polymorphonuclear cells.

The anatomic diagnosis was otitis media, causing infected thrombi in both cavernous sinuses and in the left lateral, straight and longitudinal sinuses, and acute cerebral meningitis.

I wish to express my thanks to Dr. M. C. Winternitz, Prof. of Pathology at Yale University, School of Medicine, for permission to report the work done in his laboratory.

PARENTERAL INJECTIONS OF MILK IN DISEASES OF THE EYE.

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This paper discusses the therapeutic principle of parenteral injections of milk, the different views on their action, complications and results in various eye diseases, with report of two cases. Read before the Wisconsin State Medical Society, La Crosse, September 10th, 1920.

The therapeutic aims, based on active immunization, to influence the course of infections by parenteral introduction of the morbid agent into the body, are the essence of specific vaccine therapy. Its action was attributed to the formation of specific antibodies. Further observations, however, were in conflict with this conception. They showed that the results of the vaccination do not depend upon the increased bactericidal action of the blood, but merely upon the reaction of the tissues. Diseases were cured by injections of vaccines of bacteria specific to an entirely different disease, i. e. by heterovaccine therapy. Thus, Darier recommended antidiphtheric serum for the treatment of various inflammations of the eye. Kraus, Luedke, and R. Schmidt saw the efficient principle of heterovaccine in the action of parenterally introduced albumin, foreign to the species.

Instead of the heterovaccines, foreign protein injected in the most different infectious processes, often brought about sudden recoveries. As such a protein, milk was used in various general diseases by Schmidt and Saxl; and by R. Mueller in local inflammations. Mueller and Thanner reported surprising results by milk injections in diseases of the eye. They formerly never obtained, in the treatment of any painful eye affection, such rapid subsidence of pain and photophobia as by the milk treatment in iritis, excepting only the operative treatment of glaucoma. After their recommendation, the milk injections have been employed by numerous authors, and we have reports from several eye clinics on their results in a large series of eye affections.

The technic is this: At the average 5 ccm. of fresh milk, boiled for from three to four minutes and cooled to the temperature of the body, is injected sub-

cutaneously into the gluteal region. Pillat used in the newborn and in children of up to 5 years of age, from 2 to 3 ccm., of from 5 to 15 years from 5 to 8 ccm., and in adults 10 ccm. At first the injections were made into the muscles, but, as the market milk contains abundant microorganisms, which, especially the most violent, cannot be destroyed by boiling for 4 minutes, occasionally deep seated abscesses were encountered. Four hours after injection the temperature rises to 39° C., sometimes 40° and more; and after this maximum falls within four to six hours to normal. If the temperature is very high the patients complain of headache and general malaise, which speedily subside after the cessation of the fever. Hence it is advisable to make the injection in the morning, so that the patient can be under medical supervision during reaction.

The injection may be repeated after 2 days and the dose increased. The subsequent temperatures generally do not reach the same acme as after the first injection. In a rather large percentage of cases albuminuria up to 0.7% was observed, with hyalin casts, epithelium and leucocytes, but disappeared on the second day.

The first few injections are determining for the therapeutic effect. If this is not attained, not much can be expected from a continuation. In general, the treatment is finished with from 5 to 6 injections.

Altho L. Mueller made over 1,000 injections of milk without any complications, a number of authors reported chills, formation of abscesses, anaphylactic symptoms, local and general, herpes labialis, exanthems, hyphema in iritis, protraction of the fever to 3 weeks, rekindling of tuberculous processes, per-

foration of deep ulcers, proteinogenous cachexia, anaphylactic shock; and even anaphylactic deaths (Steiger, Berneaud, Maschler, Holler, Koenigstein, Lubliner, Reiter, Sachs, Schittenhelm and Weichardt). To avoid these, Lubliner recommends to make the second injection not before the 5th day. Jickeli, Holler, Steiger, and others, therefore, emphasize the desirability to find a preparation of known constitution which may be administered in uniform doses. They decidedly warn against the generalization of milk injections as a therapeutic means, on account of the danger of anaphylactic deaths, and recommend great caution in their application.

Instead of milk, which by 4 minutes' boiling is not made sterile, and, if boiled to absolute sterility, is claimed to lose its effect, the Saxon Serum Works of Dresden brought out a preparation under the name of ophthalmosan, which insures sterility. After its injections the fever was less intense. But the therapeutic effects also were less, as the higher the temperature and the more violent the accidental phenomena the more favorable was the effect on the eye. Berneaud, however, recommends the ophthalmosan injection for the general practitioner, Holler advises Merk's deuteroalbumosis; and Szily and Sternberg emulsion of typhoid bacilli in gonorrhoeic ophthalmia.

The mode of action of the parenteral milk injections is not yet sufficiently known. According to Abderhalden the organism reacts to the parenteral injection of albumin, foreign or similar to the species, by the formation of defensive ferments. In proportion to the different organic and inorganic constituents of the milk, and the reactive capability of the body, these must vary. Thus Englaender successfully employed inorganic substances, e. g. salt, in infectious diseases. Berneaud's experiments on the action of the different constituents of the milk are not yet concluded.

Holler attributes great importance to fermentative processes in the action of proteins by which specific curative processes are mobilized, as Luedke proved increase of complements and Heilner of protective ferments. According to Berneaud the action cannot be specific; be-

cause no immunity is attained, as the relapses in eczematous keratitis demonstrate, and the fact that in luetic parenchymatous keratitis the affection of the second eye cannot be prevented by the injection. The inflammatory products are rapidly removed, so that the natural forces of immunity of the organism can fully develop and bring about recovery from the disease. Thus in iritis first the injection and exudations in the anterior chamber disappear. The milk acts as an absorbent, not as a disinfectant.

The increase of temperature is given great importance, on account of the better results from the milk injections the higher the temperatures were. This is in analogy to the favorable influence of intercurrent febrile diseases on the course of inflammatory affections, e. g., the remarkable improvement of trachoma during an epidemic of scarlet fever in 40 children, and of a case of polyarthritis, observed by Huehn. The fever also causes changes of metabolism, blood circulation, and organic functional disturbances. Lindner and others ascribe the astonishing results in gonoblenorrhœa to the deleterious influence of higher temperature on gonococci, the most sensitive ocular bacteria to heat. This corresponds perhaps with the better results of milk injections in gonorrhœic epididymitis and orchitis than in ordinary gonorrhœa, because the urethra has a lower temperature than the trunk. Pillat thinks the effect of higher temperature lies in increased protective power of the organism and the products of disintegration of albumin, whose absorption may be the effective element. The duration of the higher temperature may be too brief to damage the gonococci; and the longest persistence of gonococci in the upper fornix, which in consequence of its protected site has a higher temperature than the other parts of the eye, finally the disappearance of gonococci if only a temperature of 38° C. was reached after the injection, seem to speak against it. Von Thanner and R. Mueller see an important factor, aside from the higher temperature, in the leucocytosis; and R. Mueller in the hyperemia and transudation at the inflamma-

tory focus, corresponding to the experimental anaphylactic shock in animals.

To decide this experimentally, Guist placed, in 2 cases of onesided blennorrhea, secretion and epithelium scraped from the conjunctiva into 2 test tubes with physiologic salt solution, in the incubator at 37°. After the injection of milk the conjunctiva of the healthy eye was scarified and, when the highest temperature was reached, scrapings from it brought into one tube at 37 degrees. Four hours later the gonococci in this tube were swollen, not well stained with methyl blue. Almost all polynuclear cells were loaded with gonococci, whereas the gonococci of the control tube were scarcely changed, and only exceptional in the leucocytes. The difference was so striking that Guist is inclined to assign the main effect of the milk injections to the increased activity of the cells, and not to the higher temperature alone.

With regard to the therapeutic results, I may here quote from the detailed report by Berneaud from the Eye Clinic in the University of Kiel, on 225 cases, treated with milk injections, viz., 27 of parenchymatous keratitis, 65% eczematous keratitis, 20 of trachoma, 40 of iritis, and 10 of choroiditis. According to Berneaud milk injections exert an undoubtedly favorable influence on inflammations of the eye, with unusually good results in some cases. In parenchymatous keratitis pain and photophobia were relieved only in 50% of the cases. An affection of the second eye could not be prevented. In eczematous keratoconjunctivitis photophobia and pain almost always subsided, and the general condition of the children improved. Relapses, however, could not be averted. In iritis the results were favorable almost without exception. Even severe tuberculous affections of the iris showed remarkable improvement. In disseminated choroiditis vision may be greatly ameliorated as long as the neuro-epithelial cells have not been damaged. Ulcerations of the cornea in trachoma were beneficially influenced, but not the trachomatous process itself. Ulcers of the cornea from foreign bodies healed rapidly, and hypopyon readily subsided. If after perforating injuries an infection

set in, it was alleviated by the milk injections. In a case of internal hemophthalmus, with only perception of light the patient could count fingers after 2 injections. Nothing definite can be said on results in sympathetic ophthalmia, but a trial with injections is recommended. Brilliant results may be obtained in ophthalmogonorrhea, so that an attempt with the injections is imperative in every case.

In general, other reports coincide with this (Maschler, Jickeli and others). Elschnig, however, had no results in two cases of blennorrhea. Others, e. g., Bachstet, saw splendid effects in some cases, in others not. He thinks that some strains of gonococci, e. g., in a series of cases from the same source of infection, may be refractory to the injections. Especially was this the case if gonorrhea was combined with trachoma (Koenigstein, L. Mueller, Lauber), or if the gonococci occurred in symbiosis with other bacteria, e. g., Xerosis bacilli, Koch-Weeks bacilli (L. Mueller, Pillat). On the other hand, Rosenstein, from his good experiences on 65 cases of trachoma, urges the injections in each case, particularly with inflammatory symptoms. Very favorable is the influence of the injections on the beginning involvement of the cornea in blennorrhea (L. Mueller, etc.). Uddgren in some cases made the surprising observation that the previously negative or doubtful Wassermann reaction was rendered positive by the milk injections, and recommends them for provocation of the Wassermann reaction.

For illustrating an instance with, and one without, complications after milk injections, I beg to add 2 cases of my own observation.

CASE 1: A boy, aged 19 months, affected with probably miliary tuberculosis, was suffering from phlyctenular kerato-conjunctivitis with violent blepharospasm, rhagades at the temporal canthus, eruptions of the skin of ears, nose and mouth, enlarged cervical and mesenteric glands. Von Pirquet positive. Altho the corneal infiltrations improved under the usual treatment (from March 6, 1920), photophobia and blepharospasm persisted obstinately. I therefore

made, on April 19, 1920, a subcutaneous injection of 5 ccm. of pasteurized milk, boiled for 10 minutes, into the gluteal region. The temperature rose in the afternoon, but the child seemed otherwise comfortable. The next day an eruption developed on face and body, which was diagnosed by a dermatologist as measles, and the patient was sent home. A day later the condition of the eye was improved, and the, undoubtedly protein, rash had disappeared.

CASE 2: A girl, aged 6 years, affected

with corneal infiltrations, and severe photophobia and blepharospasm which did not yield to treatment, was given an injection of 5 ccm. of milk, boiled for 10 minutes. The result was most striking; the photophobia and blepharospasm subsided the next day.

Finding the results very encouraging, I shall continue to try the injections in appropriate cases, but, for greater safety, I shall boil the milk for at least 10 minutes, which did not seem to impair its therapeutic value.

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SENSITIVITY OF ILLUMINATION SCALE FOR DETERMINING EX- ACT AMOUNT AND PLACEMENT OF CORRECTION FOR ASTIGMATISM.

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BRYN MAWR, PA.

This paper, based on work done in the Department of Psychology of Bryn Mawr College, reports the comparative results of the illumination scale and the usual clinic methods in testing astigmatism without and with a cycloplegic, and irregular astigmatism. It was read before the American Ophthalmological Society, June, 1919.

There are doubtless many ways in which sensitivity may be added to the acuity test for the detection of small errors in refraction and in their correction. In connection with the problems which we have undertaken during the past eight years involving modifications and refinements in functional testing, three principles have come to light which can be used very effectively to this end. That is, the eye which suffers from an insufficient resolving power shows the following functional defects. (1) An undue lag or slowness in making the adjustments needed for clear seeing. (2) A marked loss in power to sustain the adjustments needed for clear seeing. And (3) an increase in the amount of light required just to discriminate details in the standard acuity object. The devising of test methods based on the first two of these principles has been treated of in former papers. The third alone will be considered here.

The relation of the illumination scale to the detection of small errors in refraction and their correction may be stated briefly as follows: In so far as the test object is concerned, clearness of seeing depends upon the value of the visual angle subtended and the intensity of the illumination. It follows from this that either the illumination scale or the visual angle scale may be used for the detection of errors in refraction, i. e., in the diagnostic procedure either the illumination may be held constant and the visual angle varied, or the converse.

Since the visual angle scale sustains by convention a 1:1 relation to acuity while acuity changes slowly with change of illumination for all but very low illuminations, the illumination scale possesses the greater sensitivity for the de-

tection of small errors in refraction,—also the greater feasibility of contrivance and manipulation. Used in this way the illumination scale becomes in effect an amplifying scale—somewhat analogous to the use of the tangent scale in detecting small deflections in the magnet system of a galvanometer—and has an advantage in sensitivity in proportion to the amplification. In clinic practice it has been shown to be of particular value in determining the exact amount and placement of the correction of astigmatism.

That is, if the eye has equal resolving power in all meridians, the amount of light required just to discriminate the test object in all meridians will be the same; if the resolving power is not equal, the amount of light required will be different in the different meridians and different by an amount proportional to the amplification represented by the illumination scale. This gain in sensitivity over the clinic methods is needed in particular to determine the exact amount of the correction in case of high astigmatisms and both the amount and exact placement of the correction in case of low astigmatisms.

The checking up of a number of cases shows that the corrections by the clinic methods may be and frequently are off from 0.12 to 0.25 diopter in the strength of the cylinder and, in case of low astigmatisms, from 5 to 20 degrees in the placement of the cylinder axis. While errors of this magnitude may or may not be troublesome in the ordinary uses of the eye—sometimes they are very troublesome indeed and perhaps always tend in time to increase the amount of the defect—they do constitute a much more serious handicap, perhaps an actual disqualification, for work or vocations re-

quiring special ocular proficiencies, e. g., keen acuity, particularly keen acuity at low illuminations; the power to sustain acuity; speed in the use of the eye, especially speed of discrimination and of making the adjustments needed for clear seeing at different distances; etc.

Moreover it is safe to say that a considerably greater amount of light is required as a comfortable and efficient working minimum by the poorly than by the well corrected eye. Indeed our experience with the tricornered relation

produced an increase of only 28 per cent in acuity.

The amplification within the latter range of illumination is doubtless too great for feasibility of application. That is, too wide a range of illumination would have to be used to compensate for the difference in the resolving power of the eye in the poorest and best meridians in the ordinary run of astigmatisms. The range from 1 to 9 meter-candles is, however, quite feasible and the relation between the two scales (visual angle and

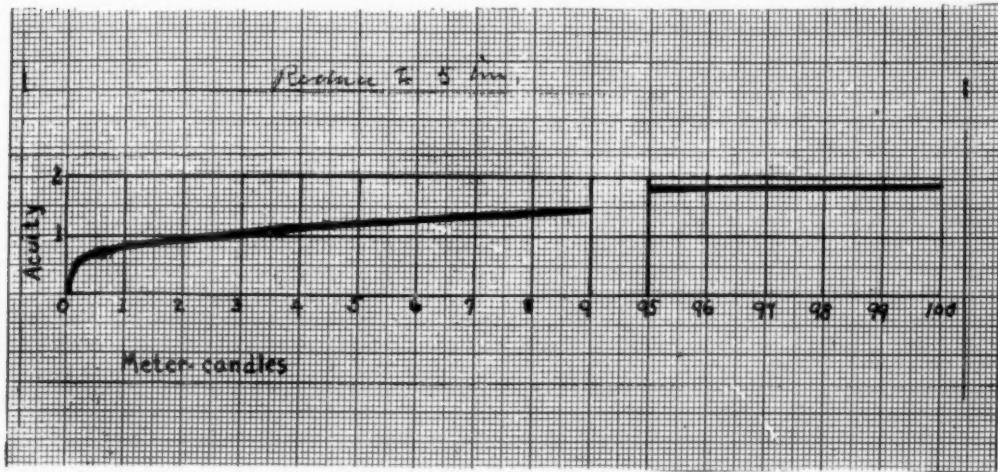


Fig. 1.—Showing the relation of intensity of illumination to acuity (Koenig, 4 observers).

of intensity of light, resolving power and retinal sensitivity to acuity has impressed us with the relative importance of resolving power, in explaining the difference in the amount of light that is required by different people as a working minimum.

The relation of the intensity of illumination to acuity may be illustrated by the curve shown in Figure 1.

This curve represents the average result for four observers, tested by Koenig.¹ In this curve acuity is plotted along the ordinate and intensity of illumination along the abscissa. It will be noted, for example, that a change from 1 to 9 meter-candles, an increase of 800 per cent in the intensity of illumination, produced an increase of only 74 per cent in acuity; and a change of 9 to 100 meter-candles, an increase of 1011 per cent in illumination,

illumination) gives abundant sensitivity. These values fall within the range given by the apparatus described in our former paper,² 0.07 to 9.2 meter-candles. The testing of a large number of cases of astigmatism with this apparatus showed that in the majority of cases the minimum amount of light required for the discrimination of the opening in the broken circle (visual angle, 1 min. at 6 meters) in the most favorable meridian was of the order of 1 to 3 meter-candles; in the least favorable meridian, of the order of 6 to 9 meter-candles.

A convenient apparatus for using the illumination scale for detecting low astigmatisms and small errors in the amount and placement of their corrections was described in a former number of this journal.³ In this apparatus, it will be remembered, uniformity of illumina-

tion of the test surface was secured by projecting upon it the image of an evenly illuminated aperture at the inner end of a projection tube of a lantern or lamp house. In order to secure a uniform illumination of this aperture, the lamp house was lined with opal glass ground on one side and the aperture itself was covered with a slide of ground glass. The source of light was a 100-watt type C Mazda lamp, of the round bulb or stereopticon type with its filament well above the aperture to be illuminated, and the changes of illumination were produced by an iris diaphragm placed immediately behind the focussing lens in the projection tube which reduced the illumination without changing the size or shape of the image.

The test object was a broken circle fastened at the center of a graduated dial, the opening of which (visual angle, 1 minute at 6 meters) could be turned into any meridian that was desired. The angle of turning could be read in terms of the divisions on the dial, which was graduated to correspond to the readings on the trial frames used in office and clinic work. The results given in this paper were obtained with this type of apparatus. They are fairly representative of the large number that have been obtained.

In the testing and demonstration of the sensitivity and serviceability of the illumination method for determining the exact amount and placement of the correction of an astigmatism, the following types of material have been selected. (1) Artificial astigmatisms made with cylinders of low diopter value. In choosing to include artificial astigmatisms in this work it should be understood that we did not consider the artificial astigmatism the exact functional equivalent of the natural astigmatism. We are too strongly impressed with the possibility that the astigmatic eye may progressively acquire power to compensate in part for its defect to be of this opinion. They were selected because we wished to have in one set of cases an exact knowledge of the amount and location of the defect as a check on the determinations made by the test. (2) Natural astigmatisms without a cycloplegic. (3)

Office and clinic cases with a cycloplegic. The difference in result between the most and least favorable meridian or between a true and a false correction have thus far been of considerably greater order of magnitude with than without a cycloplegic, either in case of a natural or an artificial astigmatism. (4) Office and clinic cases, submitted to us by experienced refractionists, in which the apparatus has been used merely to check up corrections already made by the clinic methods, objective and subjective. Among these cases it was comparatively rare to find one in which the minimum amount of light required to discriminate the test object in the corrected meridian was even approximately equal to that required in the other meridians. And (5) irregular astigmatisms. The results of these tests were presented in a former paper.³

For the artificial astigmatisms three cases were used: (a) low astigmatisms produced by weak cylinders; (b) small errors in the placement of the correction of low astigmatisms; and (c) small errors in the amount of the correction of low astigmatisms.

Of the large number of natural astigmatisms tested space will be taken here for the representation of only a few cases.

ASTIGMATISM (WITHOUT A CYCLOPLEGIC).

CASE 1 (age 13 years). R. Correction by clinic methods, + 0.25 cyl., ax. 70°. (Placement of axis could be varied over a range of about 45° and cylinder could be changed to 0.12 diopter without noticeable change in the results by these methods.) With this correction illumination required with opening of circle in meridian of cylinder axis, 0.20 m.c.; at 90 degrees from this position, 0.55 m.c.; difference, 0.35 m.c. or 175 per cent.

Correction by illumination method, + 0.12 cyl., ax. 55°. With this correction equal illumination (0.16 m.c.) was required for the discrimination of the test object in all meridians.

Difference in amount of light required for discrimination of test object in least favorable meridian for the two corrections, 0.39 m.c. or 244 percent.

L. Correction by clinic methods, +0.12 cyl., ax. 180°. (Placement of axis could be varied over a range of about 45 degrees without change in result by these methods.) With this correction illumination required with opening of circle in meridian of cylinder axis, 0.12 m.c.; at 90 degrees from this position, 0.21 m.c.; difference, 0.09 m.c. or 75 per cent.

Correction by illumination method, +0.12 cyl., ax. 15°. With this correction equal illumination (0.105 m.c.) was required for discrimination of test object in all meridians.

Difference in amount of light required for discrimination of test object in least favorable meridian for the two corrections, 0.105 m.c. or 100 per cent.

CASE II (age 48 years). R. Illumination required before correction with opening of circle in most favorable meridian, 2.93 m.c.; at 90 degrees from this position, 9.19 m.c.; difference, 6.26 m.c. or 214 per cent.

Correction by illumination method, -0.50 cyl., ax. 105°. With this correction, equal illumination (2.93 m.c.) was required for the discrimination of the test object in all meridians.

L. Illumination required before correction with opening of circle in most favorable meridian, 2.35 m.c.; at 90 degrees from this position, 5.25 m.c.; difference, 2.90 m.c. or 123 per cent.

Correction by illumination method, +0.37 cyl., ax. 137°. With this correction, equal illumination (2.35 m.c.) was required for the discrimination of the test object in all meridians.

IRREGULAR ASTIGMATISM.

CASE I (age 32 years). L. Illumination required with opening of circle turned right, left, and down, 0.97 m.c.; when turned up, 5.25 m.c.; difference for two halves of vertical meridian, 4.28 m.c. or 441 per cent.

ASTIGMATISM (WITH CYCLOPLEGIC).

CASE I (age 25 years). R. Correction by clinic methods, +0.50 S. ⊖ +0.37 cyl., ax. 15°. With this correction, illumination required with opening of circle in meridian of cylinder axis, 2.46 m.c.; at 90 degrees from this position, 9.19 m.c.; difference, 6.73 m.c. or 274 per cent.

Correction by illumination method, +0.5 S. ⊖ +0.37 cyl., ax. 30°. With this correction, equal illumination (1.61 m.c.) was required for the discrimination of the test object in all meridians.

Difference in amount of light required for discrimination of test object in least favorable meridian for the two corrections, 7.58 m.c. or 471 per cent.

CASE II (age 35 years). R. Corrections by clinic methods, -0.62 cyl., ax. 180°. With this correction, illumination required with opening of circle in meridian of cylinder axis, 2.32 m.c.; at 90 degrees from this position, 9.19 m.c.; difference, 6.87 m.c. or 296 per cent.

Correction by illumination method, -0.75 cyl., ax. 180°. With this correction, equal illumination (2.09 m.c.) was required for the discrimination of the test object in all meridians.

Difference in amount of light required for discrimination of test object in least favorable meridian for the two corrections, 7.10 m.c. or 339 per cent.

ASTIGMATISM (CHECKING UP OF GLASSES).

CASE I (age 42 years). R. Correction by clinic methods, -0.50 S. ⊖ -0.37 cyl., ax. 10°. With this correction, illumination required with opening of circle in meridian of cylinder axis, 2.34 m.c.; at 90 degrees from this position, 7.35 m.c.; difference, 5.01 m.c. or 214 per cent.

CASE II (age 45 years). R. Correction by clinic methods, -0.25 S. ⊖ -0.50 cyl., ax. 125°. With this correction, illumination required with opening of circle in meridian of cylinder axis, 2.02 m.c.; at 90 degrees from this position, 6.67 m.c. in one half of meridian, 7.82 m.c. in other half; difference, 4.65 m.c. (230 per cent) and 5.80 m.c. (287 per cent). Astigmatism may be slightly irregular.

L. Correction by clinic methods, -0.50 cyl., axis 80°. With this correction, illumination required with opening of circle in meridian of cylinder axis, 0.97 m.c.; at 90 degrees from this position, 5.62 m.c. in one half of meridian, 6.23 m.c. in other half; difference, 4.65 m.c. (479 per cent) and 5.26 m.c. (542

per cent). Astigmatism may be slightly irregular.

In the above reports of cases we have, for the sake of brevity, used the term clinic methods, instead of specifying in greater particular the tests employed. Where we have made the comparison ourselves between the illumination method and the methods ordinarily employed in office and clinic work, we have used the acuity method, the astigmatic charts, the point of light test and the ophthalmometer (in some cases). The acuity method was used in different ways. In one, patterned after a procedure much employed, some character difficult of discrimination and taxing the resolving power of the eye in as many meridians as possible, such as the letter B, was selected. It was brought to or near to the threshold of discrimination by fogging, by changing the visual angle by the use of a graded scale of illumination, etc., in order to make the conditions favorable to a sensitive judgment and the strength and placement of cylinder were determined which gave the maximum clearness of seeing.

In order to decide between doubtful determinations other acuity tasks or tests were imposed. That is, we not only used the acuity test as it is ordinarily employed, but have endeavored in many ways to add to its sensitivity and precision without sacrificing its distinctive features. However, in collecting the data for the comparison we have preferred to lay the chief stress in the cases in which clinic testing has been done by practicing ophthalmologists, who have very willingly given us their cooperation. In all cases but one which have been submitted to us for testing, the physician himself has accompanied the patient, looked after the cycloplegic and has inspected every step of the test procedure, the principle of the apparatus and method having previously been made familiar to him. Care was taken on both sides that a fair comparison of sensitivities was made.

Doubtless the apparatus can be used in different ways depending upon the experience and preference of the operator. For example, the minimum amount of light required to discriminate the test

object could be determined for one meridian and the setting of the light control be held constant while the test object is rotated into the different meridians, the observer being required to judge in each case whether the same or more or less light would be required for its discrimination. This would serve as a rough indication of whether or not the eye is astigmatic.

The exact meridian of the defect, that is the meridian in which the greatest amount of light is required to discriminate the opening in the circle, could be determined through a series of settings of the test object and the light control. The placement of the correction having been determined, its amount could be found by the strength of cylinder required to render the minimum illumination needed to discriminate the test object the same for all meridians, or more roughly speaking for the meridian of the defect and at 90 degrees either way from this position.

A quicker and more feasible method, however, is first to make an approximate determination of the amount and placement of the correction by the clinic methods and employ the illumination scale only for a more precise determination. In using this method as a refinement on the clinic methods, the procedure we ordinarily employ is as follows: The patient's eye is fitted with the strength and placement of cylinder indicated by the clinic tests; and the minimum amount of light required to discriminate the opening in the circle is determined in four positions, two in the meridian of the cylinder axis and two in the meridian at right angles to this. If the minima are not equal in these four positions, the cylinder is shifted and the determinations are made again in the four positions, the opening of the circle always being in the meridian of the cylinder axis and the meridian at 90 degrees from it. As a precautionary measure other positions may also be tried. If no placement of the cylinder is found which gives equal minima for the four positions, the strength of the cylinder is changed. The strength and placement of cylinder which require both equal and the smallest amounts of light for the four positions

of the test object are accepted as the final correction.

The apparatus can also be used to advantage with astigmatic charts of the sunburst type, the radial lines of which are no more than 5 degrees apart, in the preliminary approximate determination of the axis of the defect. In this case the procedure is to reduce the illumination until only one or perhaps two of the lines stand out clearly. This would give a sensitivity roughly speaking of about 5 degrees, and requires little more time than is usually consumed in the use of the astigmatic charts.

In our own work we have found out that the apparatus would be very helpful even if it were used only to check up the corrections made by the clinic methods, and were not employed further as an aid in finding out the exact amount and placement of the correction. For example, it requires but a very few minutes to determine with the apparatus whether any given correction equalizes or levels up the resolving power of the eye in the different meridians. The advantage of a checking method which is definite and at the same time feasible can readily be appreciated by any one who has tried to decide by the present meth-

ods in any wide range of cases just what should be the exact amount and placement of the correction of an astigmatism.

The method has its chief value perhaps in those cases in which it is particularly difficult to make a decision by the clinic methods, that is, in determining the exact amount of the correction in cases of high astigmatism and both the amount and placement of the correction in case of low astigmatisms. The simple character of the judgment, namely, the mere indication of the direction in which the opening of the circle points, instead of the more difficult task of deciding under the more or less rough conditions of office and clinic testing, whether this or that placement or strength of cylinder gives the clearer vision, together with the objective check on the correctness of each judgment, also contributes to make the method especially valuable in case of children and the subjective, unintelligent and untrained type of adult. A further advantage of the method as worked out in connection with the present apparatus is its great sensitivity for the detection of irregular astigmatisms. The lack of satisfactory tests for this troublesome defect is generally conceded.

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PERIMETRIC CHART USED FOR MEASURING RETINAL LESIONS.

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The chart here referred to serves to indicate the actual size of retinal lesions corresponding to any given scotoma or narrowing of the visual field. The need for this is pointed out and other methods considered.

This paper is presented in an endeavor to show the practicability and usefulness of what is thought to be an improvement over our present methods for estimating more accurately the size and location of retinal lesions—an improvement that

scientific if the size and location could be given in millimeters.

In an attempt to facilitate measurements of this kind Epkens and Donders made an elaborate ophthalmoscope, with a micrometer attachment which was used

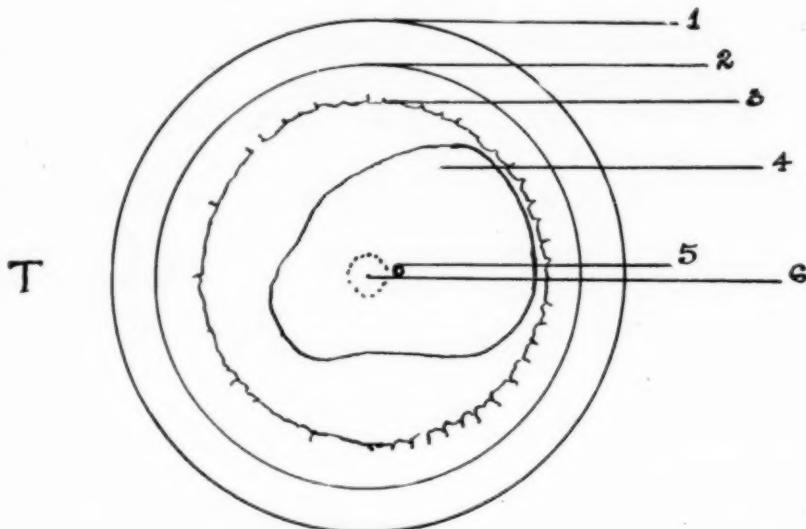


Fig. 1.—Diagram of projection of inside of eye, 22 mm. diameter. 1. Center of cornea. 2. Circle corresponding to attachment of iris, 6 mm. from center of cornea.¹ 3. Ora serrata, irregular shape and sharp projections directed toward corona ciliaris.² 4. Sensitive portion of retina, the normal average field. 5. Optic nerve. 6. Area centralis, center of which is the fovea.³

might be of clinical value, in that we are enabled by its use, to picture in the mind's eye, these conditions in their actual size.

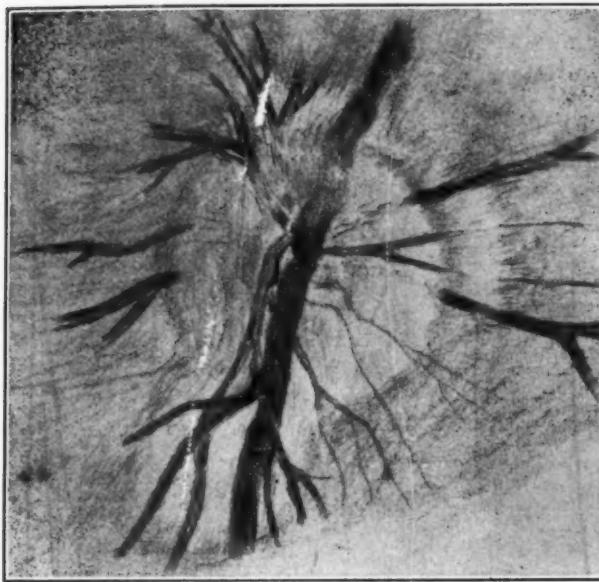
The real size of the fundus, being seen highly magnified, is seldom appreciated. It requires an imagination to think of the disc as being only about 1.5 millimeters in diameter, and the fovea only 3¹ or 3.5 millimeters² away from it. An observer will define a lesion as being "about the size of a dime," by comparison with the size of the disc, or that it causes a scotoma of so many degrees. It is felt that the representation would be more

for calculating the size of the parts seen. Schneller made a similar attachment for measuring the inverted image, which could be applied to any ophthalmoscope. Zander⁵ gives complete descriptions and illustrations of both the above devices, which were made very shortly after Helmholtz developed his first ophthalmoscope. Frost and Stephenson⁶ designed a fundus-gauge, consisting of a rectangular network of fine wires, which when attached to an ophthalmoscope, threw its shadow on the fundus, thus mapping it out into squares. In 1886, Dr. Thomas Reid of Glasgow, designed an electric

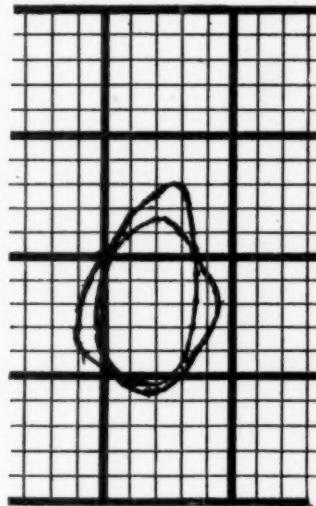
ophthalmoscope with a prismatic reflector and a micrometer scale, an image of which was projected on the fundus.⁷

There are several methods by which a certain area on the retina may be estimated after being charted by the aid of a perimeter or campimeter. The formula most often used and which needs no ex-

portion. For example, take an object 66 cm. in size and 33 cm. in front of the nodal point. By either of the above methods the size of the retinal image would be twice the distance of the nodal point from the retina, or 30 mm. This object would lie within an angle of ninety degrees and the opposite angle within the



A



B

Fig. 2.—A. Opaque nerve-fibres, O. S. B. The record, made on Bissell chart, with lines 1° apart and equal to $\frac{1}{4}$ mm. on the retina, making the reading easy. The inner oval is the outline of the blind spot of the right eye, which is normal. By inverting the reading it will be seen that the greatest extent of interference with retinal function is below, about $\frac{3}{4}$ mm. Vision O. U.=6/5.

planation is that the size of image =
15 mm. \times size of object

distance of object from nodal point.
If this method is used for calculating the actual size on the retina of one degree on the arc of a McHardy perimeter, it will be found to be .263 mm.; on the Peter campimeter one degree corresponds to .253 mm.; and on a Bausch and Lomb stereocampimeter, .247 mm.

Another way would be to multiply the tangent of the angle by 15 mm. For example, the tangent of an angle of ten degrees is .1763, multiplying this by 15 mm., we have 2.6445 mm. on the retina, corresponding to ten degrees in the field.

These methods are not mathematically correct and can be used only for a small

eye being the same, would make the image cover $\frac{1}{4}$ of the circumference of the inner surface of the eye. If we should consider 30 mm. as the distance covered on the retina by this image, and since it covers $\frac{1}{4}$ of the whole circumference, lying within an angle of ninety degrees, then the whole circumference would be four times as great or 120 mm. This cannot be, as it would make the inner diameter of this globe over 38 mm. It can thus be seen how these methods are not applicable to a large portion of the retina as they would always give a greater area than the actual size of the retina involved, the ratio being 4 to 3.

Another line of reasoning which altho it has no practical value, may be mentioned because it seems interesting. The

macular cones vary from .0025 mm. to .003 mm. in diameter,³ and correspond to a visual angle of one minute. In order to find the number of cones in one degree, we multiply the diameter by 60. This would give us the distance on the retina corresponding to one degree in the field if the macula were flat; but this is always a depression, oftentimes conical. In order to make it easy for calculation, it may be considered at the fovea, hemispherical, which is perhaps a fair average. Therefore, if the diameter of the cone is multiplied by $60 \times 3.1416/2$ the result is the distance on the retina corresponding to one degree in the field.

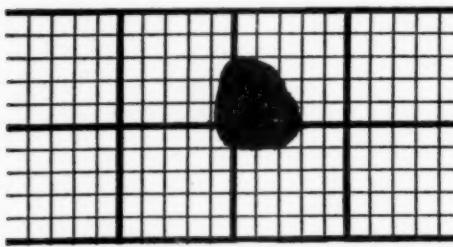


Fig. 3.—Central atrophic choroidal spot, charted on Bissell Record Card. The light lines are 1° apart and equivalent to $\frac{1}{4}$ mm. on the retina. In describing a case of this kind it is necessary only to give the size and location, without the bother of submitting the chart.

This result varies from .233 mm. to .282 mm., an average of .257 mm.

The modified chart suggested in a previous paper⁴ would eliminate the necessity of any calculation whatever. In this article it was reasoned that if it were not for the obstruction offered by the nose brow and cheek, and if the retina were sensitive all around as far forward as at its most anterior attachment, the normal field of indirect vision would be circular in outline and extend ninety degrees in every direction. Twenty-two millimeters was taken as a working average of the inside diameter of the globe. This was multiplied by 3.1416 to find the circumference from which was deducted one third for the anterior segment and the result taken as the diameter of the

retina if it could be projected into a flat circular disc.

The diameter of this flat circular disc was divided by one hundred and eighty, the number of degrees in the field which it covers and the conclusion was reached that each degree was equal to .255 mm., or about one fourth of a millimeter on the retina. On the basis of this theory any existing perimetric or campimetric chart could be so modified by placing on it a series of lines, four degrees apart in the horizontal and vertical directions, that it would be made into an actual plan of the retina, drawn to scale, the squares each representing one square millimeter on the fundus.

By taking the field or mapping out the blind spot or scotomata with any perimeter or campimeter and making the record of such on this modified chart, the size and location could be seen at once and without need of reckoning. As the modification does not in any way interfere with the readings in degrees, the new chart may be used in place of the old one, whether or not the scale is read. Charts, such as the Lloyd or Bissell, being marked in squares of one degree, which correspond to $\frac{1}{4}$ mm. on the retina, could not be changed except that instead of every fifth line, the fourth line be made heavy, making the large square equal to a square millimeter on the retina.

The method of projection used for the chart is shown in Figure 1, as it would be applied to the whole inside of the globe. The measurements are what might be considered fair averages and the scheme is drawn actual size. The few simple cases are shown merely as an illustration of the practicability and clinical advantage of the method suggested.

In conclusion, it might be said that, for practical purposes, as the results of the different methods of estimation vary so very slightly, whether or not the chart is used, four degrees in the field can be considered almost exactly equivalent to one millimeter on the retina.

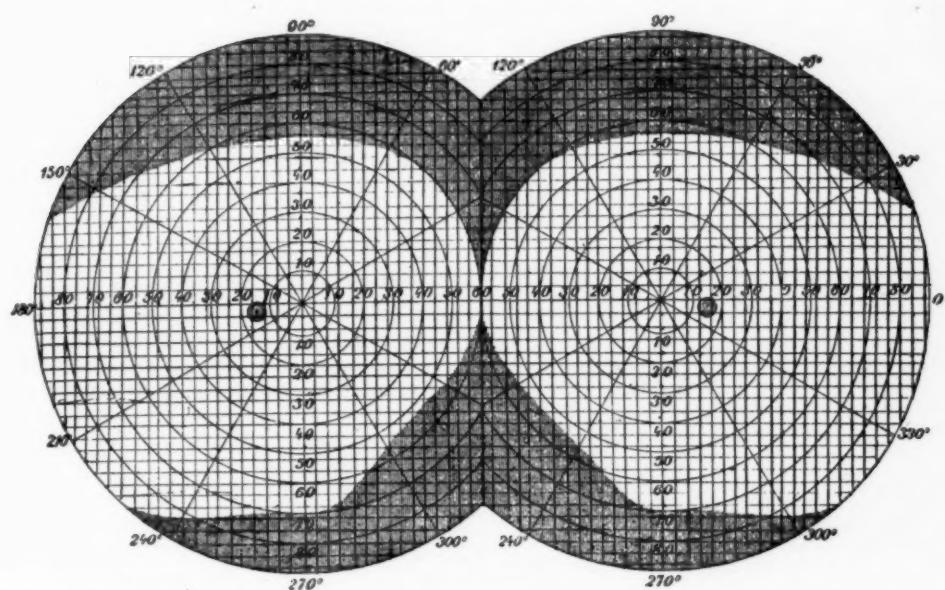


Fig. 4. Modified chart for recording fields. The series of vertical and horizontal straight lines are placed at a distance equivalent to one millimeter on the retina.

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THE MEASUREMENTS OF THE NASAL CANAL ACCORDING TO THE RACE.

JUAN SANTOS-FERNANDEZ, M.D.,

HAVANA, CUBA.

This paper presents tables showing the relative frequency of eye diseases in Cuba, especially the frequency of lacrimal disease in different races; and in comparison of whites and negroes. It also gives the results of a series of measurements of the lacrimal canal in full blooded negroes and whites, and points out the anatomic causes of greater frequency of lacrimal obstruction among the whites and mulattoes than among the blacks.

The subject is ever new, altho we have written upon it many years since (Anthropological Society of Cuba, May 5, and this is a reason why the negroes are less prone to suffer from diseases of the lacrimal passages.

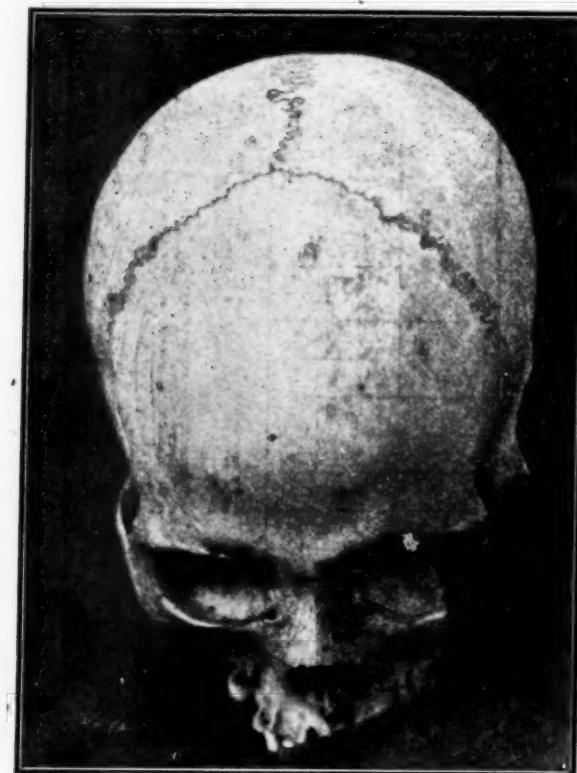


Fig. 1.—Photograph of skull of white showing entrance of bony lacrimal canal.

1878.—Bulletin of the Society No. 3, pages 49-52); and we believe that in such a great country as the United States, with one-tenth of its population black, it would be interesting either to confirm or disprove this view we have held for many years: that the nasal canal in the negro race is wider than in the whites;

I submit some photographs of skulls prepared by Dr. José A. Presno, professor of Anatomy in the University of Havana, as well as some sketches and statistics of lacrimal diseases in the different races in Cuba. But it might be well here to state that we are only studying this subject from a clinical stand-

point; and shall not try to enter into arduous sociologic problems, that we do not wish to discuss.

During my sojourn in Europe, as a student before 1875, I was really surprised with the large number of lacrimal affections seen in Spain and France, especially the former, mostly due to ob-

My first clinical investigations included a limited number of cases. Later researches covered a period of 28 years, from April, 1875, to December, 1902. During that time I was able to see 37,290 cases of ocular diseases. The lacrimal cases numbered 773, of which there were 238 cases affecting the nasal canals.



Fig. 2.—Photograph of skull of negro showing entrance to bony lacrimal canal.

struction of the tear passages. On my return to Cuba, I very soon saw that lacrimal diseases were not so frequent as in Europe, a fact I thought due to the large percentage of negroes and mulattoes in the native population. I then maintained the theory which was not then accepted, chiefly because I was not able to accompany it with the proper anatomic facts, which later I was able to obtain.

The study of new cases that even more confirmed my original ideas inclined me to go into the proper anatomic studies on the cadaver, and I was able to prove that I was right in my belief.

Both sides were affected in 57 cases, the right side only in 88 cases, and the left in 93 cases. There were 128 men and 110 women.

Among the 773 cases, there were 350 cases of chronic and 68 cases of acute dacryocystitis, or 418 in all; 45 cases had both sacs affected, 172 cases only the right side, and 201 the left. Regarding the sex, 192 were men and 226 women.

We tried to dissect fresh craniums of African negroes, a hard task because by that time slavery had been extinct for many years. It would have been less difficult if we had limited our investigations to native born negroes.

From an anatomic standpoint, the sac and nasal duct are a continuous passage for the emptying of the tears into the nose. The measurements of this naso-lacrimal canal are reported in this paper. All our measurements have been taken in subjects recently dead; after having removed the soft tissues of the orbit and

From the results obtained, as shown in the accompanying charts, we can state the following conclusions:

1. That the lacrimal canal is longer in the white race than in the negro.
2. Negroes have a wider lacrimal canal than whites.
3. The distance that separates the

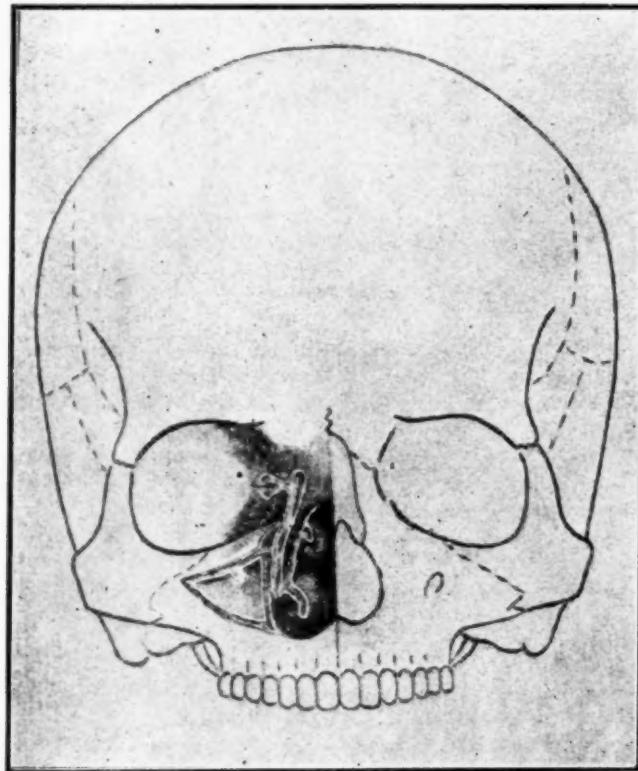


Fig. 3.—Diagram of skull and lacrimal canal in a white.

after having resected the outer portion of the maxillary sinus. In this way, after laying open the naso-lacrimal passage, we have recorded in order, the length and width of the canal vertically, as well as from before backwards, and the disposition of its internal orifice.

The material employed consisted of 24 corpses used in the anatomy classes in our School of Medicine; 15 were of white men and 9 of negroes. The cases were thus selected because a comparative study was desired. No mulattoes were included in these groups, only pure whites and pure negroes.

lower orifices from the two canals is greater in negroes than in whites, this being the cause of the lower orifice of the conduit in relation to the upper being almost always outward in the negro; a fact that could be expected on account of the greater nasal index of the negro.

4. In the blacks the direction of the lacrimo-nasal canal tends to follow a direct line. The double bend in the lateral and antero-posterior is less marked than in the whites.

5. The lower orifice of the naso-lacrimal canal corresponds in the negro to the roof of the inferior canal of the nasal

fossa; being much larger and more rounded than in white. In the white race this lower opening is narrow, more oval, and corresponds to the outer wall of the canal in almost all cases. (See Figs. 1 and 2.)

Besides the investigations on the 24 cadavers that served for the comparative

as compared with its narrowness as well as the reduced nasal index in the white.

We believe it justified, in view of the above results, to draw the following conclusions:

1. The nasal canal is longer and follows a more tortuous course in the white races. This explains the greater tendency

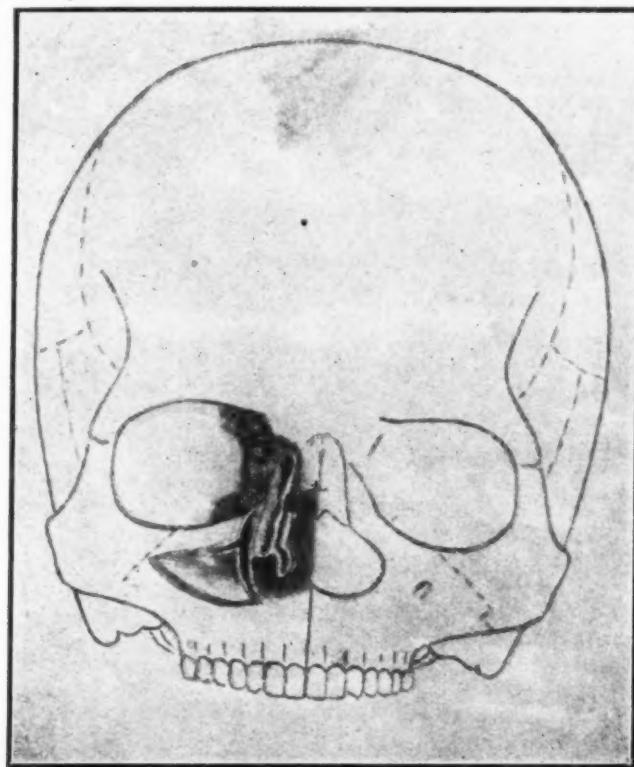


Fig. 4.—Diagram of skull and lacrimal canal in negro.

measurements, one can see in the chart of whites and blacks, that there are two more examples. One corresponds to a white woman and the other to an African negro of the Lucumi tribe. In both is clearly seen, (Fig. 3, obtained from the direct photograph), the greater amplitude of the opening in the negro,

to obliteration or narrowing of its lumen in affections of the lacrimal passages.

2. The nasal canal in the negro is wide and follows a straight course; this explains its becoming obliterated less frequently than in whites, and the rarity of sac and duct diseases in that race, as compared with whites or even mulattoes.

TABLE I.
EYE DISEASES ACCORDING TO RACE AND NATIONALITIES

| Races and Nationalities. | | | | | | | | | | | | | | | | | | |
|--------------------------|-----------------|-----------|---------|----------|---------------------|-----|-----|---------------|-----|----|---------|-----|-----|-----------|----------|-------------------------|-------------|----------------|
| White Race | Euro-peans | Lacrimal | | | Muscles and Nerves. | | | Conjunctivae. | | | Cornea. | | | Vitreous. | Choroid. | Retina and Optic Nerve. | Refraction. | Accommodation. |
| | | Passages. | Sclera. | Eyelids. | | | | | | | | | | | | | | |
| Spaniards, 920 | | 41 | 3 | 56 | 22 | 154 | 221 | 49 | 144 | 18 | 23 | 156 | 85 | 13 | 30 | 2 | | |
| Cubans, 1,980. | | 49 | 9 | 166 | 97 | 398 | 522 | 55 | 263 | 30 | 61 | 168 | 251 | 45 | 57 | 3 | | |
| Canary Islands, 162 | | 13 | 1 | 9 | 4 | 28 | 39 | 7 | 33 | 2 | 5 | 29 | 8 | 2 | 6 | 3 | | |
| Latins, 30 | Eu-ro-peans | 1 | | | | 8 | 7 | 1 | 4 | 1 | | 5 | 3 | | 1 | | | |
| Anglo-Saxons, 17 | Amér-icans | | | | 1 | 2 | 2 | | 4 | | | 3 | 3 | 2 | | | | |
| Latins, 22 | Latins, 22 | 1 | | | | 5 | 2 | 3 | | 4 | 4 | 3 | | | | | | |
| Anglo-Saxons, 9 | Anglo-Saxons, 9 | | | | | 2 | 3 | | | 2 | | 2 | | | | | | |
| Mulattoes | Mulattoes, 181 | 2 | 7 | 5 | 8 | 36 | 71 | 6 | 10 | 1 | 2 | 25 | 11 | 2 | 2 | 1 | | |
| Cuban Negroes, 352 | Cuban Negroes | 6 | 7 | 15 | 14 | 36 | 140 | 12 | 26 | 4 | 11 | 70 | 12 | 9 | 21 | 2 | | |
| Negroes | African Negroes | 1 | | 5 | 2 | 12 | 19 | 1 | 22 | 1 | 8 | 32 | 2 | ... | 3 | 1 | | |
| Chinese | Chinese | | | 3 | ... | 12 | 23 | 1 | 2 | | 1 | 4 | 1 | | 5 | | | |

TABLE II.
NUMBERS OF PATIENTS TREATED FROM APRIL, 1875, TO DECEMBER, 1902: 37,290

TABLE III
WHITES.

| No. | Age. | Birth. | Length of the Duct. | Diameter | |
|-----------|------|--------|---------------------|-------------|--------------|
| | | | | Of the Sac. | Of the Duct. |
| 1. Man | 30 | Spain | 27 m.m. | 4 m.m. | 3 m.m. |
| 2. Woman | 33 | Cuba | 26 m.m. | 3 m.m. | 2½ m.m. |
| 3. Woman | 49 | Cuba | 26 m.m. | 3½ m.m. | 3 m.m. |
| 4. Man | 54 | Cuba | 28½ m.m. | 4½ m.m. | 3½ m.m. |
| 5. Man | 39 | Cuba | 27 m.m. | 3½ m.m. | 2½ m.m. |
| 6. Man | 36 | Cuba | 27½ m.m. | 3½ m.m. | 3 m.m. |
| 7. Man | 56 | Spain | 26½ m.m. | 4 m.m. | 3 m.m. |
| 8. Man | 52 | Cuba | 28 m.m. | 5 m.m. | 4 m.m. |
| 9. Woman | 56 | Cuba | 27 m.m. | 3½ m.m. | 2½ m.m. |
| 10. Woman | 67 | Spain | 27 m.m. | 4 m.m. | 3½ m.m. |
| 11. Man | 25 | Cuba | 27½ m.m. | 4 m.m. | 3½ m.m. |
| 12. Man | 24 | Cuba | 28 m.m. | 3 m.m. | 3½ m.m. |
| 13. Man | 25 | Cuba | 28 m.m. | 3½ m.m. | 3 m.m. |
| 14. Man | 23 | Mexico | 27 m.m. | 4 m.m. | 3½ m.m. |
| 15. Woman | 60 | Spain | 28 m.m. | 4 m.m. | 3½ m.m. |

NEGROES

| No. | Age. | Birth. | Length of the Duct. | Diameter | |
|----------|------|--------|---------------------|-------------|--------------|
| | | | | Of the Sac. | Of the Duct. |
| 1. Man | 65 | Africa | 26 m.m. | 5 m.m. | 4½ m.m. |
| 2. Woman | 80 | Africa | 25½ m.m. | 5½ m.m. | 4½ m.m. |
| 3. Man | 90 | Africa | 26 m.m. | 6 m.m. | 5 m.m. |
| 4. Man | 65 | Africa | 26 m.m. | 5 m.m. | 4½ m.m. |
| 5. Woman | 82 | Africa | 26 m.m. | 5½ m.m. | 4½ m.m. |
| 6. Woman | 80 | Africa | 25½ m.m. | 4½ m.m. | 3½ m.m. |
| 7. Woman | 60 | Africa | 25 m.m. | 6 m.m. | 5 m.m. |
| 8. Woman | 60 | Africa | 26½ m.m. | 5½ m.m. | 4½ m.m. |
| 9. Woman | 70 | Africa | 27 m.m. | 5 m.m. | 4 m.m. |

TABLE IV

Number of eye cases: 32,290. Number of lachrimal diseases, 773. Affections of the duct, 238.

| Races. | | | | | | | | | | Sex. | | Age. | | | | | | | | | |
|---------|------------|------------|-----------------|------------------|---------|------------|----------|-----------|------|--------|------------------|---------------|----------------|-----------------|-----------------|-----------------|------------------|------------|------------|-----------|----|
| Whites. | | | | | Negroes | | | | | | | | | | | | | | | | |
| Cubans, | Spaniards, | Europeans, | Canary Islands, | North Americans, | Cubans, | Mulattoes, | Chinese, | Mexicans, | Men. | Women. | 1 day to 1 year, | 1 to 5 years, | 5 to 15 years, | 15 to 25 years, | 25 to 50 years, | 50 to 80 years, | 80 to 100 years, | Both Eyes, | Right Eye, | Left Eye. | |
| 105 | 97 | 2 | 18 | 4 | 1 | 1 | 4 | 5 | ... | 1 | 128 | 110 | 1 | 13 | 19 | 47 | 122 | 36 | 57 | 88 | 93 |

Percentage of cases of nasal canal diseases as compared with the total numbers of patients treated: 0.63 per cent.

Percentage of cases of nasal canal diseases as compared with all cases of diseases of the lacrimal passages: 30 per cent.

Percentage of white patients of the nasal canal, as compared with the total number of cases: 0.60 per cent.

Percentage of white patients of nasal canal, as com-

...to the point of being nearly as bad.

pared with total number of cases of lacrimal disease in all races: 95 per cent.

Percentage of negro patients of the nasal canal, as compared with white patients of the nasal canal: 2.20 per cent.

Percentage of negro patients of the nasal canal, as compared with the total number of cases: 0.01 percent.

Percentage of negro patients of the nasal canal, as compared with the total number of cases of lacrimal diseases, in all races: 2.10 per cent.

PREPARATION OF OPHTHALMOLOGISTS FOR GROUP PRACTICE.

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This paper from the Section on Ophthalmology of the Mayo Clinic emphasizes the value of group practice and the importance of ophthalmology in it. It is believed that future advances in ophthalmology will be greatest along medical lines, and therefore medical ophthalmology is especially needed for group practice. The proper training for this work must include two or three years of special opportunities and sound instruction. Presented before the American Academy of Ophthalmology and Oto-Laryngology at the Kansas City meeting, October, 1920.

The formation of clinical groups by physicians for the diagnosis of disease and the treatment of patients is one of the newer features of medical progress. The forces behind this movement have been active since the beginning of specialization, in fact they originated in specialization, and have gained power with each new discovery and each bit of scientific advancement. Specialization in medicine became necessary when the fields of investigation of disease processes in man were extended by the invention of optical instruments and the development of the various branches of chemistry. The invention of the compound microscope opened the way to all our knowledge of histology, histopathology, and bacteriology, and incidentally revolutionized the conception of disease transmission. From the ever widening fields of chemistry and biology came new and practical methods of investigation and examination of body fluids and secretions, and rules for their application to the problems of medical practitioners were instituted.

Medical men ever have been quick to grasp tools from scientific discoveries in whatever field they may be found. Men who had been educated and trained in the practice of medicine voluntarily shut themselves off from actual practice and devoted their time and talents to the investigation in the laboratory of influences bearing on the cause and transmission of disease in order that thru greater devotion to a limited field they might add materially to the science of medicine.

The laboratory service now requires the full time of men of high grade intelligence, of liberal acquaintance with

fundamental sciences, and wide knowledge of the advances in clinical medicine and surgery. All are familiar, of course, with the development of laboratories and all recognize their usefulness. Methods of physical examination have been improved by checking physical findings with laboratory findings. "The function of the clinical laboratory worker is to aid the ward worker. The findings of the former are seldom conclusive, and must be interpreted in the light of the ward findings; especially is this true now that functional diagnosis is the goal."¹ No one will attempt to estimate the distinct value of laboratory training in our interpretation of bedside observations, but no one who has had laboratory training denies the miserable darkness thru which he would have to grope had he not had it. The pathologist is not indispensable to the surgeon, and the physiologic chemist is not needed in the majority of cases studied by the internist, but the aids to diagnosis provided by what the pathologist and chemist have taught us are constantly employed to make clear the significance and relationship of symptoms and signs of disease that would otherwise remain obscure. Let us deny that we are bound to the laboratory, but admit that we are better physicians because of what we learned in the laboratory. Let us admit that we learned in the laboratory because someone before us had limited his field of investigation that he might develop it the more, and we, thereby, conceive the value of specialization.

The study of fundamental sciences and their application to health problems early became a specialized feature in the study of disease. Development of the

fundamental sciences gave new methods of study of clinical problems. Physicians then limited their practice to fields in which by employment of highly specialized knowledge they had become more proficient. Altho their practice was limited their study was broadened. Practitioners in special fields spend more time and study in preparation for their work than is required for general practice. Clinical specialties, then, are not deviations from general medicine; they provide ways and means for better practice.

The first division of general medicine into laboratory, medical, and surgical fields, was quickly followed by further divisions until now the list of specialists has become quite long. Yet the basis on which such divisions have been made is obvious in the light of the time required to master the technic of a subject and keep abreast of the special advances, to say nothing of adding to the knowledge we already have by carefully planned and efficiently executed research.

Specialism, as it is practiced today in ophthalmology, otology, neurology, urology, and other well established branches of medicine, needs no argument for justification. No practitioner claims to be equally versed and proficient in the various departments of medical practice. He has come to rely on the opinion of specialists for the diagnosis of the more obscure diseases of his patients, and often of their treatment. The field of study of each specialist is, however, not confined to the organ or system upon which he prefers to specialize. The condition of the kidney is of importance to an expert in cardio-renal disease, the teeth to the gastro-enterologist, and the eyes to the neurologist; in fact all specialties are so interwoven that the examination in all departments is of value in complicated or severe illnesses. The patient's general physician alone cannot hope to bring to light the early changes that bear upon the patient's condition, so it has become quite common to have a patient go from one specialist to another for examination and opinion.

With specialism thus justified the next step toward better service is the association of competent specialists. An oph-

thalmologist may report to an internist that his examination of the patient who was so kindly referred to him reveals the fact that the patient has a diplopia and lowered visual acuity. He may go even further than that. He may report that the patient has a paralysis of an external rectus muscle and a neuroretinitis, and that he has tested the patient's refraction and prescribed glasses. But does that satisfy the internist? Hear what he says:² "Seldom in their reports to us of patients we refer to them do ophthalmologists note how sensitive or anesthetic is the macular region when a ray of light is thrown on it. We always test that for ourselves, and it sometimes helps us in determining by further examination some past forgotten illness. It is very seldom that they report on the stippling of the macular region which dates back to a nephritis of pregnancy years ago. It is seldom that they note the slight traces of an old neuroretinitis."

The opinion of an ophthalmoscopic picture given by an ophthalmologist will be weighed by the internist and credited in the light of what he knows of the skill behind that opinion. So an internist usually selects one oculist to whom he sends his cases. The consideration of the specialist's opinions is the ground work of group diagnosis. Such diagnosis is practiced daily in our hospitals. The recommendation of the College of Surgeons that hospital staffs have frequent conferences is another movement in the direction of group diagnosis.

It is significant that many clinical groups are made up of men who served in camps or base hospitals of the army during the world war where they learned to contrast the value of cooperative effort in professional achievement with the rival practice in private as a means to personal prestige and competence. Recent graduates who have completed an internship in a general hospital and two to five years of postgraduate study in a clinic are the most ardent advocates of group practice. Experience has shown them the value of highly specialized training and the benefit of expert opinion in specialties other than their own. The value of group study among non-organized physicians is not disputed.

Group study by an organized group of physicians will not be condemned when such organization is perfected by men of ability for better service on an ethical basis.

The university hospitals of our medical schools are organized groups for group study. The University of Michigan Hospital has recently inaugurated clinical conferences which are open to the physicians of the state for discussions of cases. It is commendable in small communities that the physicians should quickly follow the examples of their teachers and organize similar diagnostic groups. I do not know what the general experience may be, but my own experience, limited in years altho diversified in territory, leads me to state that county medical societies do not fill the place demanded for group work. Splendid scientific programs are often held, but we may as well be fair with ourselves and admit that as brass tacks they are highly upholstered. The clinical conference is as necessary in group study as the meeting of a board of directors of a corporation; specific cases are discussed and reviewed to the benefit of the patient and the physician. Such conferences must be held in strict confidence and in all sincerity. Only those who have lived in these conferences can appreciate the true value of them. The knowledge of each man is called out to its fullest width, his training and powers of observation laid bare, and his true worth made manifest to himself and to his fellow practitioners. These conferences become schools of instruction where all are teachers and at the same time pupils. The study and diagnosis of disease by specialists is better carried out if these specialists are in organized groups.

The majority of groups that are being organized have the benefit of the patient as the basis. Better diagnosis, quicker service in the office, and better hospital service are secured by closer cooperation. More men are enabled to devote their time to a special service and thereby markedly improve their efficiency. Men who unite in a group usually spend some time attending postgraduate schools to brush up in special work, and more time in visiting other clinics and attending

scientific meetings. The average physician is made better by this postgraduate study and thru the group practice opportunity is offered to many who if they continued in private practice would not spare the time nor money necessary to take it.

In discussing group practice I leave out of consideration the financial adjustment. There is too much to be said on both sides of this issue to go into that here. My personal experience in the formation of a small group and working in a large group convinces me that satisfactory financial arrangements can be made. I will only say that the ideal way to practice can be followed, will be followed, to the financial betterment of some and at a loss to others, but the same spirit of selfdenial that leads able specialists to hold positions with small salaries in our medical schools, denying themselves the luxuries that would come from their incomes in private practice, will lead other men to positions of honor in service in groups of clinical workers.

What is the position of ophthalmology in such groups and what training in ophthalmology is necessary to fit a physician to carry the responsibility of oculist in such a group? Ophthalmology is the oldest and most highly specialized of the divisions of clinical medicine and more likely to be practiced independently of general medicine, yet no phase of the work is really independent. The signs and symptoms of bodily disease that are gathered by examinations of the eyes are too well known to be detailed here. External examination of the eyes, examination of the fundus, and testing of refraction all have a place in the general examination of a patient. Fergus³ says "Personally, I would not regard a man as fitted to enter the profession of medicine unless he could use an ophthalmoscope to examine the fundus. It is the use of the ophthalmoscope as an instrument of medical research rather than of ophthalmic investigation that is of importance."

The treatment of most ocular diseases can be carried out better by an internist or specialist in another field than by the oculist. In the present day of special practice no oculist is justified in inde-

pendently treating syphilitic diseases of the eye, tuberculosis of the eye, metastatic infection, endocrin disturbances, neuroretinitis, choked disc, disturbance of the motility of the eye, or even headaches with error of refraction. The ophthalmologist, on the other hand, can be of marked service in treating systemic disturbances. All patients with cardiovascular-renal disease, hypertension, nephritis, diabetes, diseases of the blood and of the blood-forming organs, diseases of the central nervous system, syphilis, tuberculosis, diseases of the skin, and pregnancy should have as part of their routine examinations careful external and ophthalmoscopic examinations by specialists who know the details of the findings of the internist or other examiners.

Batten prophesies⁴ that "further progress in ophthalmology, as far as one can see, will be mainly on medical lines, and will require men with a physician's training and experience." The desirable amount and character of training required to fit a man as ophthalmologist in group practice is stated in a quotation from Fergus: "Lastly the ophthalmic practitioner should know all the symptoms in the organs of vision which indicate systemic diseases or diseases of the brain and nerve system. No man can learn this amount of work unless he has had a training in an eye clinic and in pathologic and physiologic laboratories for at least three years. A man, in my opinion, has no right to be regarded as a specially qualified ophthalmic surgeon unless he has spent three years at clinical ophthalmology and in laboratory work."⁵

Seventeen of the leading ophthalmologists of this country answered an inquiry as to their special preparation in ophthalmology after graduation and before taking up private practice and gave their opinions on the time necessary for special study today. The shortest preparation was three years, the shortest advised one year. The longest preparation was ten years, the longest advised six years. The average preparation was five years, the average advised from three to six years.⁶ It is estimated that there are nearly 4,000 long term graduate students in the

United States this year who wish to prepare themselves by two or more years of study for practice in some special clinical field.⁷ "Most of these men need opportunity to work alone, not in classes, tho under general supervision, for six months to a year in one or more of the fundamental branches. Then they need clinical material and laboratory and library facilities for two or more years of intensive work in diagnosis and treatment. They need personal responsibility for patients, inspiration to investigation, keen criticism and opportunity for fearless discussion with real leaders in their specialty. They need little, if any, formal teaching, of which most of them have already had too much."⁸ The opportunities for such instruction in ophthalmology are woefully lacking, but if the specialty is to keep abreast with other fields in group practice the need is apparent. Dr. Parker at the University of Michigan was, I believe, the first to realize this need and inaugurate a regular three years' postgraduate service in a University. The University of Colorado offered a University degree in Ophthalmology after two years of special study. The University of Minnesota followed by offering a University degree after a three years' service, later offering the degree of Master of Science after two years' service and the degree of Doctor of Philosophy after three years' service. An internship of one year, preferably in a general hospital, however, is required for eligibility to fellowship.

It is immaterial whether a university degree be offered for special work in ophthalmology. That is a question to be decided by other minds and lies outside the scope of this paper. The trend of the times, however, is strongly toward more preparation, longer time spent in clinical work, and more attention given to medical phases of ophthalmology. The student wants patients, not lectures, cases, not books, and opportunity to study cases with the internist and other specialists. Six months to one year may be spent with profit in fundamental sciences, anatomy, physiology, pathology, bacteriology, and physical and physiologic optics, and from two to two and one-half years in clinical work and

research. The University of Minnesota provides nine months in the fundamental branches and twenty-seven months in clinical work. Six to twelve of the twenty-seven months are devoted to work in a subject, as a minor, related to ophthalmology. The fundamental work is given in the University by department heads and capable assistants, the clinical work at the University and at the Mayo Foundation in Rochester. The closest possible relationship is maintained at the Mayo Foundation and Mayo Clinic between the specialties by a connecting link; graduate students with majors in ophthalmology are assigned to sections in medicine, neurology, and so forth, for study in their minor subjects. In addition to this students in other specialties are given twenty-four hours in medical ophthalmology and ophthalmoscopic demonstrations. The object of the latter is better to acquaint the internist and others with the importance of ophthalmology as a diagnostic aid and to encourage the employment of an ophthalmologist in consultation practice. The more familiar the internist becomes with ophthalmology as a diagnostic aid the more will he require of the ophthalmologist. To the general surgeon and particularly the neurologic surgeon the ophthalmologist's

work is invaluable, but must be of high merit.

In conclusion I would emphasize the following points:

1. Group study in medicine is necessary for the employment of the best diagnostic methods.

2. Group practice carries the same advantage to the patient in therapeutics as does group study in diagnosis.

3. Greater preparation is being sought by men who wish to specialize and take up group study and practice.

4. The position of ophthalmology in group study and practice is of the utmost importance.

5. The greatest advances in ophthalmology to be made in the future will be along medical lines.

6. More intensive training in medical ophthalmology is required to fit men for special work in group practice.

7. Graduate courses in ophthalmology covering periods of two or three years should be offered in hospitals and clinics thruout the country, to provide opportunity for students who desire to prepare themselves more efficiently for group study and practice.

8. Closer cooperation between ophthalmology and other specialties should be fostered in hospitals and clinics.

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NOTES, CASES AND INSTRUMENTS

HIGH MYOPIA IN A CHILD.

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This case is reported as it is unique in the writer's experience. None has been found in the literature tho cases similar to this may have been seen and not reported. Several busy confreres have been questioned about their experience in myopic conditions and could recall no parallel case. Even in races predisposed to high myopia the high degrees do not develop in young childhood.

The patient under consideration was first seen in November, 1917, when he was 5½ years old. His mother was distressed because he held objects within three or four inches of the eyes and could see very poorly at distance. She had noticed this ever since he had paid any attention to smaller objects. She reported that one eye had turned in at times when he was younger. He had had no children's diseases except whooping cough at two years. His general health was excellent and he was a rugged, bright youth. Parents both see well without glasses.

EXAMINATION showed vision O.D. 3/60, O.S. 2/60; with correction O.U. 2/6. Exophoria 8 degrees. Eyes externally normal except turning out under cover and both slightly prominent. No conical cornea. The Javal ophthalmometer showed a regular astigmatism with the rule of one diopter in O.D. and one half diopter in O.S. Fundi were normal except a slight stretching on temporal side. Total error O.D.—16; O.S.—18.

TREATMENT. Patient was refracted under complete atropin cycloplegia and the full correction was prescribed in lenticular lenses. The condition was fully described to the mother and the danger of an increase in the condition pointed out. School was prohibited and he was denied the use of children's books with any but the largest pictures and print. Permission was given the mother to teach him the alphabet and printing but only with very large letters, and for short periods.

She was instructed to report back with him every month for examination and direction of management. He accepted the wearing of his glasses very nicely and always demanded them immediately after washing his face and the like. He held objects at the proper distance and got much pleasure out of his improved distance vision. He was seen about once a month at the office during the following five months. During that period there was no increase in the error, no increase of stretching and corrected vision improved to 5/12. During the writer's absence from the city in military service for the fifteen months following this period, the patient was looked after by a confrere and the only change in that period was an increase of one diopter in the prescription for the left eye. Since his return sixteen months ago the child has been seen frequently and the refraction checked up and the frame adjustment carefully looked after. His condition now shows no increase in the error or stretching and a vision each eye 5/9.

It has been very satisfying that there has been no progress in the myopia during the three years he has been under observation and care, especially thru this anatomically formative period. We believe that the intelligent help of the mother has been quite a factor in the result. At what age the condition started or what caused it we cannot say.

PARALYSIS OF ACCOMMODATION.

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The following case is of interest because of its abrupt termination.

September 29, 1920, Miss M. G., age 23, stenographer, gives history as follows: Discharged from hospital two weeks ago after a seven weeks' stay for diphtheria of moderate severity.

Complaint: Three weeks ago suddenly was unable to read or see anything close to her eyes.

Examination showed partial paralysis of soft palate which she stated had been much worse. Tonsils were infected and small amount of albumin found in urine. Pupils reacted normally to light but not to accommodation. They were equal and of normal size. Refraction showed: R. plus 0.75 s. \odot 0.75 c. ax. 90° = 6/6. L. plus 0.75 s. \odot plus 4.50 c. ax. 60° = 6/12. Fundus showed areas of exudate above and below both discs.

Treatment consisted of the new correction: Ferrous carbonat and strychnin in capsule. Advised tonsillectomy.

October 18th tonsils were removed under ether anesthesia, and on recovery the accommodation had been completely restored. She had attempted to read just previous to operation and was greatly astonished when print became clear on awakening.

This paralysis would have probably cleared up soon without the operation, but to my mind it was hastened thereby. An element of hysteria might have been superimposed on an organic condition.

DERMOID OF ORBIT.

CLIFTON M. MILLER, M.D.,
RICHMOND, VA.

A. B. Female. Age 9 years. Seen Sept. 1st, 1904. No deformities or dermoids in other members of family. Father and mother living, in good health. Born July 5th, 1895. Healthy normal baby. No deformities of any kind.

A few weeks after birth the parents stated they noticed a growth of some kind under the left eyelid. A short time later a hair or two projected under the lid and these continued to grow in length and increase in number until there were six or seven long black hairs growing from under the lid. These hairs grew rapidly and were frequently cut to prevent their hanging too far down on the face but were always left sufficiently long for the cut ends to project beyond the lids.

Examination shows a healthy, well developed girl, with no deformity except about the left eye. Left upper lid is permanently drooped and seven or eight

coarse black hairs project from beneath it. Tumor is in left orbit on temporal side. On looking down with very slight elevation of lid an ovoid pinkish mass, elastic to the touch is seen beneath the temporal portion of the upper lid, from the most prominent portion of which the hairs were springing. The covering epithelium was fairly adherent to the underlying portion of the tumor. Pressure was painless. The eye was pushed somewhat downward and inward by the mass. Under a general anesthetic, the tumor was removed without difficulty. No bands of adhesion to frontal bone could be demonstrated.

Tumor 26 x 18 x 8 mm., central cavity containing yellowish fluid. A small bony mass the shape and size of the crown of a canine deciduous tooth was found in the tumor. Diagnosis: lipodermoid of the transition fold, containing hairs and a deciduous tooth. This case has been examined in the past few weeks. There is no appearance of any return of the growth. The eye is normal, in movement and appearance, nor is there any physical weakness except a condition somewhat resembling angioma of the left vocal cord.

TRAINING OF THE HANDS.

CALVIN C. RUSH, M.D.,
JOHNSTOWN, PA.

The Japanese wrestler, whether the champion of the empire or a stoker in a trans-Pacific steamer, does not undertake a match without first stamping the ground with all his might to limber up the hip joints; the American baseball pitcher is not permitted to enter even a minor game without first "warming up" by practice; but some ophthalmologists perform delicate operations of the greatest consequence to their patients without any preliminary training of the hands.

Many operators have found that heredity or manual labor has given them rather thick "farmer's hands," better suited to gross than to fine movements. The exercises which the writer used to acquire a more delicate control of his fingers form the basis of the suggestions contained in this paper.

The first and greatest requirement for a steady and manageable hand is a feeling of self confidence or self mastery. An operator can hardly hope to have a steady hand in the operating room if he does not have a control of himself elsewhere. To acquire this control he should form the habit of making his movements—especially those of his hands—deliberate and steady movements. The knowledge that one is steady in his movements is of great psychologic importance when a delicate operation is undertaken.

To further bolster up his self confidence the operator should acquire a greater deftness in the use of his hands. A good practice, as suggested to me by Dr. Howard of Peking, is that of doing the common or usual things in an unusual way—e. g. one may reverse the use of his hands in eating, in brushing the teeth, in combing the hair, etc. Such exercises will give one greater facility of movement with both hands. As another simple exercise one may reverse his hands in shaving. No man who is afraid to risk his own skin with a razor in his left hand should presume to risk his patient's eye with a Graefe knife in his left hand.

In using a pen the operator will do well to practice neatness, regularity and fineness of penmanship, instead of the abandon which so many physicians affect.

In preparing the hand for more delicate movements certain exercises to lessen the stiffness of thumb and fingers are helpful:

1. With force press the thumb toward the little finger, i. e. press the thenar against the hypothenar eminences.

2. Forcibly flex each finger and at the same time press the finger backward.

3. Extend all the fingers to the limit by pressing the corresponding fingers of each hand together.

4. Practice the child's game of crossing the second finger over the first and vice versa.

These simple exercises are sufficient to greatly aid in the mastery of the hands.

To prevent the hands from becoming stiff it is advised that gloves be worn when the hands are used for strenuous play or work. To acquire familiarity with the movements required, the beginner cannot be advised too strongly to operate repeatedly upon the eyes of animals. These can usually be obtained from the butcher.

The operator cannot disregard his personal habits if he is to succeed. Excesses of tobacco or coffee should be avoided. That which is an excess for one may not be an excess for another. I know an eminent operator who cannot smoke cigarettes on the morning of his operating day without a tremulous hand, while a well known surgeon of India is said to operate while smoking.

Regular hours of sleep are most important and should be seldom broken. It goes without saying, that all these rules will be of little avail when accompanied by excessive venery.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

BELGIAN OPHTHALMOLOGICAL SOCIETY.

April 25, 1920.

Phacoerisis.

I. BARRAQUER, Barcelona, Spain, described his operation of phacoerisis and demonstrated the instruments employed for it. The results obtained are said to be most brilliant.

Peripapillary Hemorrhage in a Myope.

MARBAIX, of Tournais, reported a case of such hemorrhage occurring in a woman who suffered from high myopia. The report was illustrated with drawings by the patient, showing the subjective changes during resorption of the hemorrhage.

Rodent Ulcer with Perforation of Both Corneas.

H. COPPEZ, Brussels, presented a case in which the ulcers had repeatedly perforated the cornea and produced prolapse of the iris and in the last perforation of one eye the formation of cataract. On the right side the progress of the ulcer continued until it invaded the whole cornea except a small central portion. In the left eye the ulcer is stationary for the last two years.

Eyes of Masques and Statues of Ancient Egypt.

COULOMB, Paris, presented a series of 23 such eyes from old Egyptian statues and masques.

Frontal Mucocoele. Temporary Intranasal Drainage.

MORAX, Paris, in a case of frontal mucocoele, under local anesthesia, made a cutaneous incision at the level of the eyebrow. The periosteum was turned back and the mucocoele incised. The wall of the frontal sinus being opened for the purpose to an extent of 6 mm. thru the opening made by trephining, he introduced a small perforated silver drain, terminating at its upper end in a thread of silver. The lips of the wound were sutured together with this

thread passing between them. This drain was drawn out by the silver thread on the 6th day. The mucocoele has not recurred and the esthetic result is perfect.

Flexible Goggles.

BONNEFON, Bordeaux, described the making and application of simple protective goggles. A disk of card board was bent in the form of a cone, furnished with two ears exactly opposite each other to which were attached tapes forming a coquille in close contact with the skin thruout its circumference. It could be used for the simple protection or for compressive occlusion of the eye.

Artificial Tarsal Cartilage.

KLEEFELD, Brussels, to combat the deviation of the cilia produced in trachoma after extirpation of the tarsal cartilage, has reconstructed a solid frame work for the lid in this way: Silk threads are boiled in 4% sublimate solution and introduced into the tissues. These threads are not absorbed, and cause in the tissues a lively reaction. As a consequence there appears new formed sclerosed tissue which is very resistant.

Choroiditis and Tenonitis.

TERLINCK, Brussels, reported a case of simultaneous metastatic choroiditis and tenonitis due to a metastatic pneumococcus infection.

Atypical Vernal Conjunctivitis.

GALLEMAERTS, Brussels, reported on this case.

In a boy aged 12 years, the corneas presented at their periphery a border several mm. wide, deeply vascularized, and resembling an enormous arcus senilis. Each year in the month of April the boy suffered from ocular itching and the conjunctival culdesac presented in slight degree the milky aspect characteristic of vernal conjunctivitis.

Fixation of Eyeball in Operation for Cataract.

H. COPPEZ, Brussels, recommends in the operation of cataract a double fixation. A blepharostat is omitted and fixation forceps held by the operator are applied to the insertion of the superior rectus muscle thruout the whole of the operation. An assistant steadies the eyeball by fixation forceps applied at the insertion of the tendon of the internal rectus muscle during the making of the puncture and counter puncture and the first part of the corneal incision. After the expulsion of the lens nucleus the fixation of the superior rectus enables the operator to force out the cortical masses remaining in the upper part of the lens capsule by accurate systematic pressure.

Meningoencephalocele of Orbit.

D. VAN DUYSE, Gand, pointed out there exists a great similarity between meningoencephalocele and intraorbital colobomatous cysts. They are similar in histologic structure and perhaps have a similar primary origin. In the case he observed there had been a meningoencephalocele of which the cerebral wall was composed of layers that resemble the structure of the cerebellum. The removal of the tumor was followed by death.

High Blood Pressure and Retinal Hemorrhages.

DEWAELE, Gand, has measured the blood pressure in a series of cases of hemorrhagic retinitis. In general there was an increase in the blood pressure. This vascular hypertension is an important factor, but not an exclusive etiologic factor of retinal hemorrhage. The composition of the blood takes an equal part in the etiology and notably the conditions of uremia and cholesterolinemia.

Internal Treatment of Glaucomatous Hypertension.

WEEKERS, Liege, basing his treatment on the controlling action of calcium chlorid upon processes of transudation and exudation administered this salt by the mouth or by intramuscular or intravenous injection to 21

patients attacked by glaucoma. By regular tonometric measurements he ascertained the consequent effect of the remedy on the ocular tension. In many cases such medication produced no effect on the tension. In other cases the calcium chlorid seemed to influence favorably the intraocular pressure. In acute glaucoma the various treatments employed had not made it possible to draw clear conclusions.

Extraction of Cataract in Its Capsule.

H. Coppez, Brussels, exhibited with a cinematograph films showing Smith's operation. Four operations were thus shown, the films being furnished by the Doctors Green, of San Francisco.

Milk Injections to Prevent Postoperative Infection.

Van Lint, Brussels, at the time of operation had employed injections of sterilized milk to prevent complications due to infection. 5 ccm. were given at a dose immediately preceding operation. The reaction of the eyeball following operation with such injections is much less marked and the results obtained were very favorable.

Sterile Collyria.

Marbaix, Tournais, urged that one must provide for his patients collyria that were sterile. To avoid that such collyria should become contaminated and furnished to patients, Marbaix recommends a flask with a peculiar tubular spout thru which the fluid is expelled by expansion of the air with the warmth of the hand.

New Stain for Corneal Ulcers.

Kleefeld, Brussels, found with the corneal microscope and Gullstrand lamp that the staining of superficial lesions of the cornea by fluorescein consisted of groups of diffused greenish spots without distinct staining. The Bengal rose mixture, Victoria yellow and azoflavin give a true, vital staining to the tissues. The sound epithelium is not colored. When there is a break in the epithelium an intense rose color is caused by juxtaposition of minute points of red.

MARCEL DANIS.

**COLORADO OPHTHALMOLOGI-
CAL SOCIETY.**

October 23, 1920.

DR. J. A. PATTERSON, presiding.

Cryptophthalmos.

A. C. MAGRUDER, Colorado Springs, presented two cases of cryptophthalmos, in a boy aged eight years and his sister aged eleven years. The mother suffered from the same condition. In each case the eyelids were externally of normal appearance, except that there were supernumerary eyebrows across the upper lids. No movement of the eyeballs could be demonstrated. The boy could locate the position of a light held before either eye, the girl only before the left eye. There was no separation of the eyelids from the eyeballs.

DISCUSSION. E. M. Marbourg had attempted operation on the mother some years previously and had found dense adhesion of the eyelid to opaque corneal tissue.

W. H. Crisp, Denver, referred to the fact that the tissues of the eyeball proper, including the vitreous, were not unlikely to show other congenital defects beside those present in the tissues of the lids and cornea.

Melville Black, Denver, thought that there was nothing to be lost by dissecting down and attempting to find whether any space existed between the eyelid and eyeball.

Refractive Peculiarity in Lens.

A. C. MAGRUDER, Colorado Springs, presented a young man whose right eye showed a peculiar refractive condition in the crystalline lens, seen on ophthalmoscopic examination as a darker area in the lower part of the pupil, or sometimes in other directions, varying with the position of the examiner. Along the upper edge of this dark area ran a red line which looked like a bloodvessel, but which was produced by condensation of the transmitted color of the background of the eye. The vision of either eye was 20/40 without glasses, and 20/20 with glasses, R. -1.50 cylinder on +0.25 sphere, L. -1.00 cylinder on +0.25 sphere.

DISCUSSION. Melville Black, Denver, thought that the disturbance was really in the cornea, and represented a beginning keratoconus. He would advise close observation of the patient every six months. If at the expiration of eighteen months there had been no change in the refraction, the case could be dismissed, while if there was a progressive refractive error the endocrin condition should be gone into carefully.

J. M. Shields stated that if the light was thrown on the right eye from the left side there was a round haze well forward but central, about as would be seen in beginning cataract.

W. H. Crisp, Denver, felt that the disturbance was not in the cornea but definitely in the lens, since the corneal reflection of a Placido disk was undisturbed in different parts of the cornea. He suggested that the lens condition might consist of a sort of globule or lens within a lens, of different refractive conditions from the remainder of the crystalline lens. The regularity of the cornea was further evidenced by the very normal improvement of vision produced with the cylindrical correction.

Ocular Injury Followed by Glaucoma.

A. C. MAGRUDER, Colorado Springs, presented a man aged twenty-three years whose left eye had on March 29, 1920, received a lacerated wound of the cornea from the head of a rivet. The iris was caught in the wound. A secondary intraocular hemorrhage occurred on April 4, and in spite of the repeated use of eserin the eye went on to an advanced state of glaucoma. The vision fell from 30/40 with correction on May 27 to fingers at one foot on October 3. (Iridectomy was later done on account of a severe exacerbation, and was followed by relief from pain.)

DISCUSSION. Melville Black, Denver. The patient has a foul mouth, with a number of suspicious teeth. He probably has a focal infection uveitis. At the present time an iridectomy is indicated and the mouth should be looked after. As soon as iridectomy has been performed I would put him on atropin.

W. C. Bane, Denver, referred to a case in which he had done double bilateral iridectomy for glaucoma a year ago. The patient had retained what vision she had, but continued to have pain in the eyes as well as headache. Within the last two weeks a left upper molar tooth had been found to have two roots exostosed, and the symptoms disappeared after removal of that tooth. The tonsils had also been removed since that time.

W. H. Crisp, Denver, suggested that we should think of the teeth in traumatic cases that did not clear up promptly. He referred to a case of cataract in which the discharging stump of an eye lost after previous operation had quieted down, and the second eye had done well after extraction, following removal of a number of badly diseased teeth and roots; and also to a case of blasting injury seen with Dr. Libby in which persistent irritation quieted down after attention to some diseased teeth.

H. M. Thompson, Pueblo, referred to two cases which he had seen in which failure of traumatic disturbance to clear up was due to bad teeth.

Pigmented Mole or Melanosarcoma.

E. M. MARBOURG, Colorado Springs, presented a girl of fourteen years who gave a history of a slight blow on the orbital margin of the left eye eighteen months previously, with subsequent development of a dark speck at the nasal corneoscleral margin. The growth, which seemed to have gradually enlarged, was now about 3 mm. by 2 mm. in diameter, and was very heavily pigmented, being almost black in color. A month ago the area was recorded as triangular, but the angles were now becoming rounded. The eyeball was otherwise absolutely normal.

DISCUSSION. Melville Black, Denver. The case is one for observation. There is no justification for operation unless you are certain that the growth is a melanosarcoma.

W. H. Crisp, Denver, suggested that very careful measurements of the growth should be made and recorded every time the patient came in. He further considered it absolutely necessary either to leave the eye entirely

alone or to remove the whole eyeball; since in this type of case the risk of metastasis occurring with great rapidity after meddling with the growth was very pronounced.

C. E. Walker, Denver, would remove part of the growth, and if it were found to be sarcoma would try the effect of large doses of the x-ray, and later operation.

E. R. Neeper, Colorado Springs, recalled a case shown by Dr. Edward Jackson some years ago and later reported as positively melanosarcoma; the patient having died of metastases within the next six months.

Magnet Extraction of Steel.

E. M. MARBOURG, Colorado Springs, presented a man from whose right eye a piece of steel 6 mm. long by 2.5 mm. wide and 0.5 mm. thick at the narrow end had been removed by Dr. Neeper thru the wound of entrance with the giant magnet. The piece of steel had entered thru the cornea to the nasal side of the pupil, and had lodged behind the iris at about its junction with the ciliary body. When the patient was seen twenty-five minutes after the accident, the lens was already cloudy.

DISCUSSION. W. C. Bane, Denver, believed that the eye would eventually have to be removed and possibly soon. The injury had probably involved the ciliary body. The patient had not yet got beyond the stage at which the other eye might become involved.

C. E. Walker, Denver. It is not quite certain that the ciliary body was injured, as the fragments may have dropped to the ciliary region. The main trouble is that the iris is in the corneal wound. It would be advisable to extract the lens and free the incarcerated iris.

E. R. Neeper, Colorado Springs, felt that in a similar case he would not again extract at the point of entrance, but rather thru an operative wound directly over the foreign body. It is hard to use the giant magnet in such a case without lacerating the tissues.

Unusual Deposits in Iridocyclitis.

F. E. WALLACE, Pueblo, presented a boy aged sixteen years, who since July 1 had had an inflammation of the right eye, which had gradually become more

severe. The left eye had been involved in the same way but more mildly, beginning about August 1. The symptoms were generally those of a gradually increasing iridocyclitis. The history was negative as regards the nose, throat and teeth, and a Wassermann test was negative. The right cornea was generally cloudy, the pupil contracted, the iris muddy, and the fundus invisible. On the posterior surface of Descemet's membrane was a geometric group of thirteen white spots each of which was probably about a half mm. in diameter. The apex of the fairly regular triangle in which these spots were arranged pointed downward. There was no hypopyon, altho in the lower outer angle of the anterior chamber there was a rather large accumulation of exudate. There were also several large deposits of a like character on the iris. The left eye presented a similar but less marked condition. The vision of the right eye was now limited to hand movements. The right pupil had dilated under atropin a month previously but did not at the present time.

DISCUSSION. C. E. Walker, Denver. The cause of infection may be tuberculosis. Leeches, hot applications, and dionin should be tried in addition to the atropin.

J. M. Shields, Denver, suggested an oily solution of atropin.

Melville Black, Denver, thought that the case lay between uveal tuberculosis and gonorrhea.

W. H. Crisp, Denver, suggested that the patient should be given a strong solution of atropin to use at home, on account of the great amount of dilution from the abundant lacrimation.

J. A. Patterson, Colorado Springs. Altho the case is very suspicious of tuberculosis, the possibility of syphilis should not be dismissed.

Tuberculosis at the Macula.

H. M. THOMPSON, Pueblo, presented a case of exudative chorioretinitis affecting the macular area, and measuring about four-fifths of a disc diameter horizontally and three-fifths vertically. The diseased area was elevated several

diopters, and was irregularly pigmented. There were three small vessels extending from below upward a little more than a half the vertical diameter of the lesion. Below and to the nasal side the retina was "fluffy." To the temporal side of the macular region there were several minute white spots, interspersed with small hemorrhages. In the upper part of the fundus patches of yellowish exudate with the old hemorrhage were visible. The retinal vessels seemed to be raised somewhat as they passed over this region. The retina in the vicinity of the main lesion seemed slightly edematous. The visual acuity of the right eye was fingers at three feet, left eye 20/15. The peripheral field of the right eye was not so good as that of the left. Failure of vision in the right eye had first been noticed February, 1920. The family history was negative, and four sisters and four brothers showed no signs of tuberculosis. From November, 1915, to January, 1918, the patient had been under treatment for active lung tuberculosis with a streptococcal secondary infection. In January, 1918, there was apparent arrest of the lung disturbance, and the weight had increased about forty pounds. In September, 1919, there was an acute exacerbation with gastrointestinal symptoms and some nephritis and the weight fell off twenty-five pounds. The tonsils were removed in June, 1920. Dr. Thompson exhibited a skiagraph of the chest showing involvement of both lungs.

DISCUSSION. Melville Black, Denver, remarked that there was some pallor of the temporal side of the optic disc of the right eye.

Dislocated Lens.

J. A. PATTERSON, Colorado Springs, presented a woman aged fifty-eight years whose right eye had about April 16, 1917, been struck with a piece of kindling wood which she was chopping. The eye gave no external indication of injury at that time, but the eyeground was seen thru a haze which seemed to be more marked on the temporal side. Eight days after the injury the tonometer registered 23 mm. The

outer half of the pupil failed to dilate under atropin, the temporal half of the iris seemed tremulous, and the media continued to be hazy. She complained of flashes of severe pain during which the vision was lost for periods of one half hour at a time. The vision of the right eye was 6/25, of the left eye 6/12; improved with correction to right 6/12 partly and left 6/5 slowly. The next tonometer reading, shortly after this, was 59 to 60 mm., but by February 15, 1918, under pilocarpin and eserin, this had declined to 32 mm. The patient was under the care of Dr. Crisp for some time while living in Denver. She refused operation from both Dr. Patterson and Dr. Crisp. She was not seen again until August, 1920, at which time the vision of the right eye had fallen to faint perception of light and shadow, projection being uncertain. With the ophthalmoscope only a red reflex could be made out, while by oblique illumination the iris was very tremulous and the lens capsule could be seen floating in the vitreous. Would it have been practicable to remove this dislocated lens with the scoop?

DISCUSSION. E. R. Neeper, Colorado Springs, had had a case of partial dislocation of the lens in a teacher some years ago, and had been able to remove the lens.

Senile Cataract with Congenital Coloboma of the Iris.

H. M. THOMPSON, Pueblo, reported a case of bilateral senile cataract in combination with a typical congenital coloboma of each iris. The patient was a married woman of forty-eight years. There was no history of congenital anomalies in the family. There had been four brothers and two sisters. The mother of the patient had been subject to miscarriages. The patient was a twin, and was said to have weighed two pounds at birth: the other twin was normal. The patient had married at thirty years, and had had three stillborn children and one child a boy nine years old and in good health. Wassermann test and urinalysis were negative. The vision of the right eye was 20/200, of the left eye

fingers at three feet. There was nystagmus of the right eye, and a left microphthalmus with internal strabismus. The right lens showed stellate opacity, the left lens was completely opaque. Dr. Thompson proposed to remove the lens thru an incision directed downward, bringing a conjunctival flap over the wound; and operating first on the squinting and probably amblyopic eye, in order to accustom the patient to the procedure.

W. H. CRISP,
Secretary.

SECTION ON OPHTHALMOLOGY, AMERICAN MEDICAL ASSOCIATION.

Report of the American Board of Ophthalmic Examinations.

Since the last meeting of this Section, examinations have been held in New York City, October 21 and 22, 1919, and in New Orleans, April 26 and 27, 1920. The certificate of the Board has now been awarded to more than 150 ophthalmologists, and about as many more applications for it are now pending. There still remain some American ophthalmologists who have not yet made application for it whose public records in ophthalmology would entitle them to the certificate without their being required to present case reports or to pass other examinations. Failing to make such application the opportunity will be withdrawn at the end of this year, 1920.

In the beginning such applications from men of established reputation and standing have been of distinct assistance in fixing attention on the work of the Board, and in helping to make popular this movement of raising the standard of educational requirement for those who would offer their services to the public as especially fitted for ophthalmic practice. But the time in which they could help in this way has now largely passed. Opportunity has been given to all who wish to avail themselves of it. We can now fairly suppose that those who have not applied do not care to do so, and after the close of 1920 all applicants will be required to submit case reports.

CASE REPORTS.

These submitted case reports are coming to occupy a large place in forming a judgment as to proper preparation for ophthalmic practice. It seems proper here to direct attention to what these reports should include in order to make them acceptable for their purpose.

Every report should indicate the age and sex of the patient with such other data as would serve to fully identify him or her. It should give the patient's visual acuity with a note as to whether taken with or without correcting lenses; and the date of taking it. And these records of visual acuity should be repeated as often as is necessary to throw light on the progress of the case.

In all cases the results of ophthalmoscopic examination should be indicated briefly. In refraction and muscle cases, the near point of accommodation should be included. And, in general, all points that throw light either positive or negative, on the chief condition present, or on conditions likely to be associated or confused with it, should be noticed adequately. Ocular lesions dependent on general conditions should be supported by evidence of such conditions, and an exact statement thereof included with the report. All irrelevant, particularly negative statements, should be omitted.

When a case is reported as illustrating an operation, the reason for operating, every detail of the preparation for operation, each stage of progress to recovery, and the final result obtained should be included. The Board does not care to know that a certain person had a cataract removed and saw afterwards. It wants to know how the applicant reached the conclusion that cataract extraction was needed, what form of operation was chosen, how the applicant did it, how closely he watched the patient afterward, and exactly the final result.

Each case reported should have the data regarding it arranged according to some simple rational system, showing successively its previous history (family and personal), the conditions

observed when the case was first seen, its subsequent course, the measures adopted for its relief, and the result. The writer's diagnosis should be clearly and fully stated.

The past five years have shown great improvement in the character of the case reports submitted to the Board. This is traceable in many cases to training in military service, or to the models of the American College of Surgeons. But reports are still received that are extremely deficient. As these reports are more and more important in deciding the adequacy of training for ophthalmic service it is deemed worth while thus to direct attention to the standards that should be aimed at in their preparation.

HIRAM WOODS,

WALTER R. PARKER,

EDWARD JACKSON,

Representing the Section.

Dr. William H. Wilder, the secretary of the Board, has added: It might be well to state in connection with this report that candidates are divided into three classes. Class 1, including those candidates who have practiced the specialty of ophthalmology ten years or more; we ask them to submit ten case reports. Class 2, those who have practiced for a period of more than five years and less than ten years, who must present twenty-five case reports; and Class 3, those who have practiced less than five years, who must present twenty-five case reports. The impression may have been made that the submission of these case reports is all sufficient, but that is not true. The Board is to decide whether or not these case reports are sufficient, and if it deems them insufficient it will require that the individual subject himself to further examination. One point should be emphasized, because from the character of the case reports that have been presented I think some of the candidates do not take this matter seriously enough. They have not devoted enough time and care to the preparation of such a record. The board has to rely on that and it must have a much more complete report, than those submitted with the candidate's credentials.

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JEAN MATTESON, Room 1209, 7 West Madison Street, Chicago, Ill.

CANCER INVOLVING THE EYE.

The movement for the control of cancer, largely one of education of the medical profession and the laity, will also have an influence on our scientific conception of cancer. It makes no discrimination between the various forms of malignant new growth, but places its emphasis on malignancy. It uses the word cancer in its old significance, its still common popular sense, to include every tumor or ulcer that tends to indefinite extension and to ultimate cachexia and death.

For about sixty years, since Virchow published his views of cellular pathology and the classification of tumors, the study of malignant new growths has run chiefly to the study of their cell morphology and the identification of their cell ancestry. This has been followed by an attempt to restrict the term cancer, to make it synonymous with carcinoma, a name to designate only tumors of epiblastic origin.

The classification by cell ancestry has been very useful. It has helped in the natural grouping of tumors; and

the working out of their usual clinical course and the special tendencies of each variety. Mesoblastic tumors have been separated from epiblastic tumors, and epitheliomas from carcinomas. Under the name endothelioma, a group of cases has been transferred from epiblastic to mesoblastic growths. Looking like carcinomas, they are found to belong with sarcomas. Basal-cell carcinoma is distinguished from squamous, cylindrical, columnar or gland-cell carcinoma; and the divisions of sarcomas are even more numerous.

All such refinements of classification and diagnosis have helped toward exact prognosis in any given case, and ultimately help to refinement and exactness in treatment. But, for the time, they have tended to overshadow the general character and importance of malignancy; which is essentially the same in sarcomas as in carcinomas; and demands that for practical purposes we shall take the same attitude toward every variety of growth of either class.

The cancer cell in the body corresponds to the criminal or lunatic in the

community. It is no more important to trace its ancestry thru the epiblast or the mesoblast, than to ascertain whether the criminal is negro, Chinese, or the degenerate offshoot of one of our first families. The criminal has lost the character and relations that would make him useful and has become a menace to the community, so that he must be removed from it. So the cancer cell has lost the characteristics of gland cell or endothelium, has reverted to the tendencies of some very low and primitive form, throwing off the restraints of all higher organization; and must therefore be removed from the cell community. It is not most important that a man is white or black or yellow if he is criminal; not most important that a cell is epiblastic or mesoblastic if it is essentially malignant.

Malignancy seems gradually to develop in cells that have gotten out of the line of functional usefulness—the gland cells of the breast, the papilloma of the lids or corneal limbus, or the long present melanoma; or perhaps even the chronic chalazion. The practical attitude is to regard every such cell-mass as a possible breeding place for cancer, and remove it before any cells with a distinctly malignant tendency have developed within it.

The malignancy of tumors is of all grades, and tends to increase as the cancer develops. A child had glioma of the retina, recognized when a year old. When two and a half years old the pupil was dilated, but the tension normal. Six months later the whole eyeball was packed with the tumor mass and of stony hardness; and it was enucleated. In six weeks there was recurrence in the orbit as large as a cherry, which in a month became as large as an orange. The orbit was eviscerated, but the child died six weeks later. The history of slow development over a long period, followed by rapid increase in the rate of growth, is as striking in regard to sarcomas, and it is the rule in carcinoma.

The danger of all "benign" tumors is that they may become "malignant."

A case of this kind is the one reported by Coover (A.J.O. v.3, 1920, p. 638). The tumor removed in 1903 was examined histologically and found to be a papilloma. After its removal it did not recur until 1913; then it grew very rapidly. Then in 1914 it was removed, with the eyeball and all suspected tissue in the orbit. This time it was found to be an epithelioma.

In all these cases the papilloma usually benign, has given place to cancer of the basal-cell type. This fact is interesting and may contribute to accurate prognosis for such growths. But the important fact is that in a papilloma, some cell groups are likely to develop the tendency to malignancy—*indefinite multiplication without regard to the needs of function or the organs with which they are in relation*—and the surgeon's duty is to remove them as quickly and completely as possible.

Whether removal must always be by the knife or by chemical caustics may now be questioned. The second paper in this issue brings additional evidence of the possibility of removal—destruction of all cancer cells—by radium; with a remarkable reduction of scarring. The definite statements it makes regarding dosage and method of application add greatly to its value, and must encourage the wider trial of radium.

This remedy is now becoming more widely available thru the radium "emanation," which can be sent over long distance and used on many cases before it loses its efficiency; and at relatively low cost, since the original stock of radium remains to furnish the emanation continuously, without appreciable deterioration over long periods. That radium can destroy cancer cells, apparently without damage to normal tissues, seems demonstrated. That it can thus remove a malignant growth with the minimum of scarring and displacement of tissues also seems certain.

Whether this method of removal by cell disintegration and absorption is the best for large masses of cancer cells remains to be seen. But after re-

moval of the great bulk of a growth by the knife, it may well be that the use of radium can destroy any remaining cells that have advanced far enough in the direction of malignancy to become starting points for recurrence. To destroy such isolated groups will probably require the same dosage as has been found effective for removing cancer masses.

It seems now fairly well established that normal tissues about the eye are but little affected by radium in general. The highly specialized tissues, suited to the performance of the body functions, are less influenced by it than those that have deviated from the normal type in the direction of malignancy. In this sense radium and the X-rays have a distinctly selective action. Prudence will dictate great care to keep away from the danger line as far as possible. The accidents of the early years of radiology must not be repeated. But, except for those very frequently or continuously exposed to the influence of such radiations, the danger of damage to normal tissue seems slight, from any intelligent application of radium, with the care that it is now understood to require.

Cancer has stood for thousands of years as a type of malignant fate. But it seems now that by removal of cells that are developing, or seem liable to develop malignancy, it is being brought under control. About the eye such cell masses are likely to be noticed early and while comparatively small. There prompt treatment should practically eliminate the danger of cancer in this region. Even glioma, in which the tendency to malignancy appears at a very early age, and is extremely strong, may yield to early treatment, altho this is not yet fully demonstrated.

E. J.

EXAMINATIONS INTO QUALIFICATIONS FOR SPECIAL PRACTICE.

These are capable of doing great good: By stimulating those who desire to specialize in practice to a more systematic, broad and thoro study of

their specialty. By inducing schools for graduate instruction to provide more carefully chosen, better arranged and complete courses, than they have done heretofore. By causing chiefs of clinics and teaching specialists to give more instructions and helpful supervision to the work of their assistants. By furnishing a guide by which the profession and the public may choose more intelligently the specialists to whom they confide the treatment of their patients or themselves.

The extent to which these benefits may be secured by special examinations, as those in ophthalmology, depends on the confidence that their colleagues in the specialty, the general medical profession and the public feel in the justness and discrimination of the decisions of those who conduct such examinations. This confidence must in the end rest on the intelligence, sense of responsibility, fair mindedness and sympathy of the examiners; as shown in the work of the board—the candidates they certify or do not certify, as these come to be known to the medical profession and the public.

The passing upon the character and attainments of applicants for a certificate of fitness for special practice demands, with devotion to the purpose of such examination and balance of character, the assistance of colleagues. Those who would profit most by getting such a certificate, will seek it most eagerly, and if they do not deserve it, will try to conceal their deficiencies and make improper considerations count in their favor. Some who should be certificated will hesitate to submit their claims to judges whom they do not know, or in whose fairness they lack confidence.

As is pointed out in the communication published under Correspondence (p. 61), it is with men already established in special practice that such examiners find it most difficult to deal with complete fairness. No matter how honestly he may intend to be strictly just, the examiner cannot escape from his personal character and predilections. The good natured man, who

would like to see everybody pleased, is liable to grant the certificate where there is great doubt of its being deserved. The man with a strong confidence in his own uprightness, and lacking sympathy for others is likely to do injustice in the opposite direction. Both are in danger of being swayed by prejudice, pre-judgment; impressions already fixed with regard to colleagues or rivals in practice, before the task of deciding on professional fitness was undertaken, or the facts on which such decision should be based were fairly and fully placed before them.

It is not likely that the men chosen by the profession for examiners will be consciously influenced by personal feeling. But it is very difficult for most minds to place themselves in the completely judicial attitude, by changing the usual currents of their thought of persons and actions; about which they have already taken a certain attitude, on evidence not so complete or so carefully sifted as it should be for the basis of a judicial decision. There is reason to fear that pre-judgment may be the controlling factor in decisions regarding men whose imperfections and mistakes have long been known.

Then there is danger that the granting of a certificate may be due to considerations other than those the examiners were chosen to pass upon. The Board for Ophthalmic Examinations is created to pass on knowledge and skill for ophthalmic practice, and ethical fitness for the office of professional adviser. Narrowness or breadth of education outside of this, a quarrelsome disposition, or an agreeable plausible manner, some public service, or an exhibition of meanness not connected with the professional relation, should not determine the granting or withholding of a certificate; or the certificate will lose its special significance. Fear of giving offense, and a desire to mete out punishment, must be equally excluded from any influence in reaching a decision.

The Board for Ophthalmic Examinations, or the Examiners of the American College of Surgeons, or the

newly appointed Examiners in Otolaryngology, or other boards that will be appointed to examine into fitness for special practice, have a difficult situation to meet. They need and should have the assistance of the profession they serve. Accurate information regarding candidates; unmixed with personal prejudice, and unobscured or magnified by inuendoes and general impressions, should be at their command, even regarding those candidates of whom they have no personal knowledge. Patience must be exercised in regard to the long time sometimes required to get at the significant facts, and reach a just estimate of their accuracy and importance. Most of all, they should have charitable consideration of their mistakes or prejudices, for they will make mistakes, and be swayed by prejudices; as are all other human beings.

In turn it will be the duty of these examiners to help elevate the standard of the profession, by making individual members of it better. By recognizing defects in education among the older men who grew up under a most defective educational system, or absence of system; encouraging them to get added training they need, and promptly recognizing the newly acquired fitness. By recognizing that old mistakes are honestly regretted and repented of; and by reducing to a minimum the effect of their personal prejudices and tastes; and exercising that charity for earlier errors of those who promise better things, that their own defects of judgment must ask of the profession they serve. E. J.

JOURNAL CHANGES.

With the beginning of our fourth volume the list of recently published articles, heretofore printed under the heading "Ophthalmic Literature" is transferred to the journal of that name. This will leave more space each month, which we hope to occupy with a larger number of abstracts, than it has been possible to find room for in the last year or two. The abstract department, it will be noticed, is transferred to near the end of each number.

The Ophthalmic Literature lists will now be published quarterly. This has the advantage of having all the articles on a single topic, that appear during the year, grouped in four lists, instead of in twelve, which must all be searched to find the year's literature of the subject, when a part of the list was published every month.

Any possible disadvantage in this arrangement is met by the offer that any subscriber, who desires to bring his bibliography up to date on any subject he is studying or preparing to write upon, can get the desired references up to the last paper published, by writing for them to the Editorial Office of this JOURNAL.

The two publications are still offered for the old price, and it is hoped that the efforts of our old subscribers will add enough new ones to our lists this year to make any increase of price unnecessary. With the day of issue brought to the beginning of the month, it is seasonable to wish all our readers a prosperous, progressive, Happy New Year.

MISSING NUMBERS.

Subscribers, who on examination of their files find some number of volume 3 missing, are requested to apply for duplicates at once. These can be supplied without charge for most of the issues; altho, we regret to say, that for two of the numbers the supply is already exhausted.

BOOK NOTICES.

Manual of Ophthalmic Practice. F. P. Maynard, M.B., D.P.H., F.R.C.S., I.M.S., (Retired), 338 pages, 12 colored plates and 133 illustrations. Calcutta and Simla, Thacker Spink and Co., Edinburgh, E. and S. Livingstone.

It is somewhat startling to western ophthalmologists to have the latest textbook on ophthalmology, and one of the best printed and best illustrated, come to us from India. But when we think of trephining for glaucoma, the Smith-Indian operation for cataract, the excellent reports that have come

from Madras and Calcutta, and the unbounded opportunities for clinical observation there; we begin to realize that out of the Far East we may well expect much of importance in ophthalmology.

This book is based on lectures delivered by Col. Maynard at the Medical College of Calcutta, and is intended for senior students and junior practitioners. We know of none better suited to the needs of such readers. In the crowded curriculum of the undergraduate medical school, the insufficient time given to ophthalmology makes it impossible to read carefully any of our larger text books on the subject. All that it is possible to do for the student is to make a wise selection of a comparatively few things that he can be effectively taught. These seem to be all included within this book, which contains about as much matter as two numbers of this journal.

With the essentials for the student are included some things which will be of interest to readers who are engaged in special ophthalmic practice. The chapter on "The Lens and Its Diseases" reveals the results of an experience with cataract, that could only be obtained in India. There are observations on its etiology and its clinical forms. There is also a good account of extraction in the capsule—"expression"—the author calls it; which notices the American work done upon the operation, from its introduction by Wright to the late improvements by Fisher. Similarly the chapter on glaucoma gives the results of large surgical experience and a good account of trephining.

It must be noted that this work gives nothing about the technic of major operations on the eye. This has been previously described in Col. Maynard's "Manual of Ophthalmic Operations." The omission of such matter from the present work makes it distinctly better for the medical student and general physician. Each chapter opens with an account of the anatomy of the parts, to the diseases of which it is devoted. This account is not of course a full treatise on the anatomy,

but it does bring up those points that have special relation to the symptoms, and characteristics of the diseases—what might be termed the clinical anatomy. The chapters on "Refraction" and "The Ocular Motor System and Its Defects," deal in a simple direct way with the underlying elements of physiologic optics, without any mathematics that is likely to discourage the student.

The illustrations consist largely of diagrams judiciously chosen from older treatises, the textbook of Fuchs as edited by Duane being most largely represented. There are also some half tones in black and white, which have been retouched and made more or less diagrammatic. The colored plates, however, are chiefly original. A few representing fundus conditions are taken from older works, but the larger part, 50 out of the 60 figures, those representing anterior and external ocular defects and diseases, are new; and reflect great credit on the skill of the artists that produced the originals, and the care and fidelity with which they are reproduced. They compare favorably with those of the kind to be found in any book or atlas of external eye diseases of European origin. They should be an important help to every student seeking to get a clear idea of such conditions.

E. J.

Jubilee Volume Commemorating the Sixty-first Birthday of Professor Doctor J. Komoto, Tokyo, Japan, 1920.

This is a quarto volume, of a remarkable product to Western eyes, for it is printed in Oriental glyphs. One commences with what is the last page (to us) to read, and here we find a very good portrait of Prof. Komoto, in whose honor the volume was published, on his sixty-first birthday.

Komoto is one of the live men in Japan, an oculist of international reputation. His own essays have been abstracted from time to time in this JOURNAL and in its predecessors.

Fortunately, for us who read no Japanese in the original, the book was accompanied by an extensive abstract of

each of the essays, which are by various well known authors. Some of these abstracts will be used in our JOURNAL. They deal, as does Japanese ophthalmologic literature, very largely with statistics, diagnostic methods and laboratory findings. In this the Japanese excel; as did the Germans at one time, from whom many of the leading oculists of Japan received their education.

The work is well printed and bound and on an excellent quality of paper.

H. V. W.

The Eye, Ear, Nose and Throat, edited by Casey A. Wood, C.M., M.D., D.C.L., Albert H. Andrews, M.D., and George E. Shambaugh, M.D. The Practical Medicine Series of 1920, vol. III, 382 pp., Chicago, Year Book Publishers.

For the general practitioner, or the worker in special practice other than the branches to which this volume is devoted, it is a most admirable means of getting *en rapport* with the current literature of these specialties. Even those who hold themselves out to the medical profession and the community as engaged in practicing these specialties, but take no special journal, should find this volume invaluable.

Such a publication as this develops from year to year, and this volume is notably superior to its predecessors in certain respects. The part devoted to the eye contains 186 pages. It contains 12 plates and 26 illustrations in the text. The first plate (in colors) is a reproduction on a smaller scale of Plate I, vol. III of this journal, and makes a very creditable frontispiece. All the illustrations are supplied with legends, which admirably guide the reader to the meaning expressed in the picture.

The scope and proportion of the work are shown by the space devoted to various topics. In a prefatory note the editor urges the importance of the early publication of the Medical and Surgical History of American Participation in the World War. Then 14 pages are devoted to Examination of the Eye. The Hygiene of the Eye takes 5 pages, and the Refraction of the Eye, 15 pages; the Lids

and the Conjunctiva each get 5 pages, while the Lacrimal Sac gets 16 pages; the Sclera and Cornea 5 and the Uveal Tract 13, and the Crystalline Lens 10. Then we find 17 pages on the Retina and Optic Nerve; 10 on the Ocular Muscles, 9 on Toxic Amblyopia and 8 on Glaucoma. Tumors, and Ocular Symptoms of General Diseases, each occupy 6 pages, and Ocular Injuries 11 pages. Military Ophthalmology, Ophthalmic Therapeutics, Ophthalmic Instruments and Comparative Ophthalmology fill the remaining 22 pages.

The book is made more interesting and more valuable by the many pointed comments by the Editor; either adding to the impression made by the authors abstracted, or pointing out the limits to which the views advocated can be safely accepted.

E. J.

Transactions Section on Ophthalmology, American Medical Association, 1920. 276 pages, illustrated, Chicago, American Medical Association Press, 1920.

This volume contains the papers and discussions of the Section at the seventy-fifth annual meeting of the Association, held in New Orleans in April. Its small size, as compared with the similar volumes of former years, reflects the plan of allowing each section to hold but one session each day, giving time for its members to attend other Sections of the Association, in the proceedings of which they may be equally interested. For instance at this meeting the Section of Ophthalmology met in the mornings, and the Section of Oto-Laryngology met in the afternoons; while papers and discussions in some of the other sections were of equal interest to some of the ophthalmologists.

Whether the accompanying advantages more than counterbalance the diminished bulk of the transactions of the individual section, will have to be determined by the experience of the members, and judged by officers of the association. But it is quite within the bounds of possibility, that such a decrease in the size of the volume might occur without any diminution in the total value of its contents. The care-

ful selection of subjects to be presented and the judicious reduction of the size of each paper might make the small volume more valuable than its larger predecessors. Adequate presentation of its subject in fewer words always makes a paper or a volume more valuable. It rests with the officers of the Section and the authors of papers to secure this added value.

With the decrease in the number of papers published in the volume, the reports of Committees published in it become relatively more important. There are six of these dealing with the following subjects: Standardization of Undergraduate Teaching of Ophthalmology. Ultraviolet and Visible Transmission of Protective Glasses. Report of Committee on Knapp Testimonial Fund. Report of Committee on International Congress of Ophthalmology. Report of the American Board for Ophthalmic Examinations. (See p. 51.)

Another point in which the smaller volume represents an increased value, is that the discussions on papers are published in abstract. Very few speakers talk in discussion with the brevity and directness that make the best reading; prolixity, repetition, and circumlocution are apt to characterize extemporaneous remarks. In this volume, many of those taking part in the discussions have written out their remarks and read them, this being made possible by the presession volume published for the section. The remarks made extemporaneously have also been closely edited by some one before including them in this volume. This has added greatly to their value.

In such transactions the discussions ought to be at least as interesting and valuable as the formal papers. In this volume we believe they are. If this is the case, should they not be printed in type of the same size? Page headings and paragraph headings could easily be made to discriminate between paper and discussion. The custom of printing the latter in smaller type, has tended to conceal their value, and prevent them from being as generally read. When they were more wordy, rambling and inappropriate, this was

perfectly proper and distinctly in the interest of the reader. But when the discussion contains the better matter, and in more concentrated form, it certainly should be printed in as large type.

This volume is fully up to the standard of excellence of its predecessors, which are generally known to our readers. The subjects treated herein have been widely published in the Journal of the American Medical Association, in the pre-session volume and in the program of the meeting. Hence their enumeration here is quite unnecessary. Again we urge every ophthalmologist in active practice to add these volumes to his working library.

E. J.

Taschenbuch Der Augenheilkunde für Aerzte und Studierende. Prof. Dr. Curt Adam, Privat Docent in the University of Berlin. Fourth Edition, with 72 illustrations and 4 colored plates. Urban & Schwarzenberg—Berlin and Vienna—1920.

The popularity of this socalled pocket-book is shown by the necessity of a fourth edition, embracing some four hundred pages. The book occupies a somewhat anomalous position, as it is much too complex and detailed for the average student or general practitioner; but still too brief to be classed as a textbook of ophthalmology. But it contains much clinical observation, and many practical points that can be found in few other books.

In the first five pages, intense emphasis is laid upon two methods of examination: lateral illumination, and illumination of the media by a plane mirror. The next sixty-five pages are devoted to the various medicaments employed in ophthalmology, and the other forms of treatment, both local and general, with especial attention to the forms of systematic treatment necessitated by various types of ocular disease.

The main portion of the book is devoted to a systematic arrangement of the subjective and objective symptoms of ocular disease; starting with the lids and proceeding backward. As the

various signs and symptoms are mentioned, the diseases that could be the cause are taken up and discussed briefly and the necessary treatment outlined at length. Especially good is the chapter devoted to disease of the cornea, while the chapter on iris and ciliary body is woefully lacking in even mention of the etiologic factors that are of such import to a general practitioner. Glaucoma is treated rather lightly, altho there is a good table of differential points of diagnosis between that and symptomatically similar diseases. Diseases of the fundus are not dwelt upon, as the author seems to feel that such cases belong essentially to the highly trained specialist, and do not come within the province of a general practitioner.

A good deal of space is devoted to an excellent chapter on the usual forms of injury to the eye, the diagnosis and treatment being discussed at length. This is one of the best features of the entire book, altho the subsequent chapter on compensation for ocular injury is very weak. An unusual feature is a detailed list of the Blind Institutes of Germany, with a description of each and the requirements for admission. Some two hundred odd prescriptions for the preparations employed in ophthalmology close this practical book, from which much can be gained.

H. S. GRADLE.

Etude Microscopique de l'Oeil Vivant. Prof. E. Gallemarts, and Dr. G. Kleefeld, Brussels. 80 pages, 11 plates and 3 illustrations in the text. Paris Gaston Doin, 1920.

This study of the living eye is a reprint from the *Annales d'Oculistique*, of a series of papers that have already been brought to the attention of our readers in extensive abstracts (see vol. 3, pp. 538 and 835). They cover much the same ground as the more extended, minute and theoretic papers of Koeppe, which have appeared from time to time in German ophthalmic journals during the last years.

The observations here recorded are made with the binocular corneal microscope of Czapski, on eyes illuminat-

ed by the Nernst slit lamp of Gullstrand. We may well hope that in the next few years all that are of value will be repeated and recorded in our literature in form and connections that will make them of the greatest practical service.

E. J.

CORRESPONDENCE.

STANDARDIZATION BY BOARDS OF EXAMINERS.

To the Editor: Organized efforts towards Standardization of the Medical Profession are in vogue, some of which are effective and will ultimate in the highest good. Some societies formed by a Cult or Schism are class organizations of the proletariat of the profession, tend towards commercialism and, as such cannot result in alleviation. Others lead to the establishment of an aristocracy.

The consummation devoutly to be wished lies, as usual, in the happy mean. As we are teaching one another, and learning day by day, as is no other profession, there must be a sort of aristocracy, a kind of selection of those whose life work has proven them to be leaders. We oculists are somewhat apart from the general medical profession—self-segregated specialists. But, as we are part and portion of the profession, we, too, are striving for standardization of our constituent elements. As it has been and is now, we are self appointed specialists, most of us turned by the tools of time and experience into reliable consultants for our brother practitioners, as well as expert eye surgeons.

As we are but human, some of us are not as expert, some not as skilled and some not as ethical as others. Therefore, for the protection of the public, it is proposed to confer upon those who have merited it by their past lives, or upon those who can show by the results of examination that they are specially skilled and worthy of confidence, a sort of D. S. O., in order that the public may be informed, and thus have this stamp of approval in aiding them for the selection of an oculistic consultant.

Who, then, should constitute Exam-

ining Committees for these distinguished honors? It is impossible to use democratic tactics by a general vote. We, therefore, have to resort to republican methods, selecting thru a few men, Boards of Examination. Such has been done by the American College of Surgeons and by the American Board for Ophthalmic Examinations, the latter constituted by appointment from the Section on Ophthalmology of the American Medical Association, the American Ophthalmological Society and the American Academy of Ophthalmology and Otolaryngology. As wise a selection has been made, as was possible.

For young and untried aspirants, this is indeed a good method. But for the older men, who in the course of fifteen, twenty, thirty or forty years, have made their names good, with the consequence of a few friends and multitudinous enemies, the task of the Boards is indeed difficult and at times gives rise to the suspicion of inequity. To quote a case from civil life: Is it possible that a well-known, active, enterprising politician of mature years could "get thru" without a more or less great number of enemies, great or small? And, is it possible that such a man could gain admittance to an exclusive club or secret society, without some negative votes being cast in his disfavor, despite his eminence and the good he may have accomplished for the community?

Such is, indeed, the condition when we come to selection of the older men for our exclusive medical societies and honors. It is a striking observation, characteristic of the American people, that we do not always praise a leader; but more often criticise his performances and, if he has any failings, they are magnified and brought out to public view.

It is not to the credit of the several exclusive medical associations, that they have in some cases either excluded, or held in abeyance, the names of men who have not only national, but international reputations. The "dossier" of any prominent man will be found to include not only commendations, but also some true and many untrue alleged observations, of which our selective officers cannot be personally cognizant.

Another weakness of this form of election, is the fact that, tho these special men have received official invitations to apply for registration with these societies, when refused or if their names be held without action, they have personally no means of refuting allegations which they may surmise, or which may leak out to them; as the proceedings of the Boards are conducted in a secret and un-American manner.

Some way must be found out of this muddle and the only way is by open diplomacy and not by star-chamber methods. Altho the majority of these older men have no particular use for, or need the approbation of an additional medical society or organization, it is a cause for unfavorable comment and wonder upon the methods of these organizations, to see in some instances, unknown, unskilled and unethical members sporting letters after their names, on their office cards, doors and stationery, and, when occasion allows, in the public press.

Be this as it may, the attempted standardization of the medical profession and, with it, of the oculists, by these organizations; and more particularly by the standardization of hospitals and of their visiting surgeons, has already accomplished marked good and is an uplift to the submerged part of the profession, that has not yet been admitted within the sometimes golden gates that have been opened to others.

HARRY VANDERBILT WURDEMANN,
M.D., F.A.C.S.
Seattle, Wash.

VIENNA CLINICS.

To the Editor: During my recent visit to Vienna, I went to the Allgemeines Krankenhaus, which looked about the same as it did a quarter of a century ago, except that a lot of kalsomining and painting would improve the appearance of the building. The court-yards had many temporary barracks that were used during the war; now some are used for ambulatory work. The first and second eye clinics were in the same location as years ago.

The second eye clinic (formerly Prof. Fuchs) is now in charge of Prof.

Dimmer. Prof. Dimmer and his staff of assistants received me with the utmost courtesy and permitted me to see all there was to be seen there. The clinics are perhaps not as large as in prewar times, as permits to enter Austria from Galicia and other former Crown lands are difficult to procure, and previously a large number of ambulatory patients came from the outside. For the same reason the trachoma station was not overcrowded.

Docent Dr. Lindner and assistants showed the same interest in their work as we were accustomed to observe. The assistants are paid the beggarly sum of 800 crowns (\$3.00) a month while the orderly (Diener) receives more. One of the assistants tried to get an increase in salary, but was told by representatives of the Socialistic Government that as he was not doing any physical labor he could not expect more. The doctor pointed out that the turning over of a couple of hundred eyelids daily required some physical exertion, this did not meet with the approval of the official.

After having spent some very interesting and instructive weeks at the clinic, I was told by Dr. Lindner that Prof. Neumann (otologist) had sent a letter he had received from Prof. Killian in which the latter asked his Austrian colleagues not to permit Americans to do postgraduate work in the clinics. He mentioned that Prof. Hajek (rhinologist) had already signified that he would exclude Americans from his clinics. I asked for the reason and was told that it was some sort of reciprocity, as many American Societies had cancelled the honorary memberships of German medical men.

I called on Prof. Neumann and he showed me the letter of Prof. Killian. He said he would continue to instruct Americans as before. While in his office, three young American doctors came in to have him sign their certificates of attendance. These certificates were already signed by the Dean of the University of Vienna and by Prof. Hajek, proving that the latter will not turn away American students. Hofrat Dimmer then told me

that he would gladly receive Americans in his clinics, unless he should receive contrary instructions which are not likely to be issued. I was the only American in this clinic and another American was working as hospitant in Meller's clinic.

Soap was not abundant while I was at Dimmer's clinic. Instruments need replenishing. Foreign literature is prohibitive on account of the low value of the crown, for instance, the American Journal being \$10.00 or 3,000 crowns. As this department only receives 5,000 crowns a year they cannot buy many foreign journals. Books bought in Vienna and sent to foreign states are taxed 200%. Germany also has a tax on the export of books.

I have profound hopes that Vienna will in time regain its place among the centers for postgraduate studies on the continent. All the men seem to work with enthusiasm and assiduity and look forward to better times.

Sincerely yours,
H. AUFMWASSER.

Denver, Colo.

CERTIFICATES IN OPHTHALMOLOGY.

At its recent meeting in Kansas City, the American Board for Ophthalmic Examinations conferred its certificate upon the following applicants:

| | |
|------------------------|---------------------|
| Baer, Benjamin F. | Philadelphia, Pa. |
| Ball, M. V. | Warren, Pa. |
| Bankes, Claude W. | Reading, Pa. |
| Boerner, Morris H. | Austin, Tex. |
| Blake, Eugene M. | New Haven, Conn. |
| Brown, H. Alexander | San Francisco, Cal. |
| Buck, Robert H. | Chicago, Ill. |
| Burch, Frank E. | St. Paul, Minn. |
| Clement, Charles C. | Chicago, Ill. |
| Dickson, John F. | Portland, Ore. |
| Dunlap, Lawrence G. | Anaconda, Mont. |
| Esterly, Daniel E. | Topeka, Kans. |
| Fairing, John W. | Greensburg, Pa. |
| Finnoff, William C. | Denver, Colo. |
| Fisher, Carl | Devil's Lake, N. D. |
| Fisher, Frank | Philadelphia, Pa. |
| Friedenwald, Harry | Baltimore, Md. |
| Fuller, Theron E. | Texarkana, Ark. |
| Harrell, Richard F. | Shreveport, La. |
| Harris, Clarence M. | Johnstown, Pa. |
| Jones, Leonard W. | Rochester, N. Y. |
| Lemere, Henry B. | Omaha, Neb. |
| Luedde, William H. | St. Louis, Mo. |
| McGuire, Hunter H. | Winchester, Va. |
| Miller, Clifton M. | Richmond, Va. |
| Monson, S. H. | Cleveland, Ohio |
| Moulton, Herbert | Fort Smith, Ark. |
| Olsho, Sidney L. | Philadelphia, Pa. |
| Post, Lawrence T. | St. Louis, Mo. |
| Post, Martin H. | St. Louis, Mo. |
| Roberts, William H. | Pasadena, Cal. |
| Scales, J. William | Pine Bluff, Ark. |
| Schenck, Charles P. | Ft. Worth, Tex. |
| Schwartz, William A. | Phoenix, Ariz. |
| Scott, Charles J. | Marietta, Ohio |
| Shreve, Owen M. | Erie, Pa. |
| Sleight, Raymond D. | Battle Creek, Mich. |
| Spalding, James A. | Portland, Me. |
| Stevenson, Walter | Quincy, Ill. |
| Tooker, Charles W. | St. Louis, Mo. |
| Van Kirk, V. E. | Pittsburgh, Pa. |
| Weih, Elmer P. | Clinton, Iowa |
| Wible, Elmer E. | Pittsburgh, Pa. |
| Woodruff, Frederick E. | St. Louis, Mo. |

ABSTRACTS

Sir James W. Barrett. *Fleeting Amaurosis in Children.* Medical Journal of Australia, Aug. 28, 1920, p. 196.

A girl of 9 had an attack of influenza. On return to school after two weeks she found that she could not see the blackboard. Her sight was better in a dim light than in a bright light. She had considerable difficulty in lifting her eyelids, and considerable pain in her head and eyes.

When examined, both pupils were widely dilated and fixed. The fundus and media were normal. The vision was as follows: right, 6/36; left, 6/60.

Two days later the vision rose to 6/9 on both right and left sides, but the pupils were still inactive and dilated. Complete recovery took place eight days after the first examination.

The case is remarkable, and corresponds to the type known as acute cerebral, or postconvulsive, amaurosis, first described by Nettleship (1884) and Gay (1893). The disease then remained practically unrecognized until Sydney Stephenson discussed it fully in 1905. The usual story is of a convulsion, followed by total blindness, absence of fundus changes, with fixed and dilated pupils.

Recovery of vision takes place, in the majority of cases after an interval of total blindness, sometimes extending over months. The better term for the disease is that applied by Stephenson, "fleeting amaurosis."

It is attributed to disturbances in the visual cortex, but this hypothesis fails to explain the dilatation and fixation of the pupil. The motor disturbances, ptosis or retraction, met with may be explained by involvement of the motor cortex. The case recorded is that of a nervous child, who had no definite convulsion, who is much older than is usual in such cases and in whom the loss of vision was partial and of comparatively brief duration. Barrett has seen several cases previously in infants and in young children, with recovery in every case.

L. Guglianetti. *Corneal Ulcers Due to the Meningococcus of Weichselbaum.* Archivio di Ottalmologia. Nov.-Dec., 1919, v. 26, No. 11-12, p. 641.

The author describes the case of a girl 11 years old in whom a corneal ulcer developed on the thirteenth day of epidemic cerebrospinal meningitis. The ulcer extended, including the lower half of the cornea and finally healed after a Saemisch incision and xeroform applications. The meningococcus, which had been found in the spinal fluid, was found in smears and cultures from the ulcer. The first examination showed also staphylococci, but a later scraping from the deeper parts showed only the meningococcus. Growth was typical of this organism, and agglutination was positive with antimeningococcal serum. Inoculation on the abraded cornea and in the anterior chamber of rabbits produced in the first case severe hypopyon ulcers, and in the second iridocyclitis with hypopyon.

He quotes two authors who have observed this complication in cerebrospinal fever, but states that one, Cantonnier, did not find the organism, while the other, Anargyros, found it in the conjunctival secretion of two cases but associated with the pneumococcus.

In the case of Moisonnier, who found Gramnegative diplococci in smears only of the secretion of an otherwise healthy person with corneal ulcers, he considers that the diagnosis of meningococcus was unwarranted and that the distinction between micrococcus catarrhalis and the meningococcus is not possible without cultures. This would make the author's case, he thinks, the first in which the meningococcus was proved to be the cause of corneal ulcer.

S. R. GIFFORD.

Botteri. *Peculiar Case of Polycoria.* Klin. M. f. Augenh., v. 64, January, 1920, p. 106.

The upper third of the light grey iris of the right eye and a small zone at

at the lower periphery of the iris were distinctly brown, below this a black nevus. The pupil was missing at the regular place, but in the lower temporal third of the light grey tissue, which looked like atrophic, but thickened, iris, there were 2 oval horizontal openings, separated by a bridge, 1.50 mm. wide, the pupils of this eye. The more central pupil had a normal pigment seam, the temporal pupil showed ectropion of the pigment layers. On the anterior capsule of the lens were dust like, diffusely scattered, pigment dots. Both pupils, especially the more central, reacted promptly to light and accommodation, their vertical diameters becoming smaller, the horizontal diameters remaining almost uninfluenced. Upon atropin, both pupils became nearly round. V. R. + 2.50 = 6/6.

The left iris presented a similar condition of 2 colors, but 3 pupils in the form of horizontal fissures: a lower nasal, which was the shortest, a more central, and a higher temporal, the largest. All were lined by a pigment margin and separated by iris parenchyma. Atropin dilated all pupils to pear shape. V. + 1 = 6/6. The ophthalmometer showed astigmatism R. 70° and 160°, L. 15° and 105°. Fundi without pathologic changes.

The case differed from the usual forms of polycoria, which consist in several, generally radial, fissures, besides the round pupil at the normal site.

C. Z.

A. J. Cemach. The Cochlear Reflex.
Beit. z. Anat. Physiol., Path., u. Ther. d. Ohr, d. Nase u. d. Hals., 1920, v. 14, p. 1-82.

The author describes the following reflexes: (1) The otogenic pupillary reflex. By this is meant a rapid narrowing of the pupil followed by a slow dilatation caused by the action of sound. It is found in 27% of normal persons, and is not influenced by the will. Women, children and nervous people show it best. Tuning forks, etc., produce it best, while such intensive

sounds as a fog horn are almost without effect. It is not found in absolutely deaf patients, but is found in deaf mutes with remnants of hearing. (2) The aural palpebral reflex, is a movement of the lid varying from a slight twitch to a forcible closing of the eye, and is found in 95% of normal persons. It is controllable by the will, and is less apparent after testing several times. It is best elicited by sounds like a pistol shot, also by tuning forks with a high note. It is absent in total deafness, but present where there is any remnant of hearing. Three others, the conchal, the tensor and the general muscular reflexes have no clinical significance.

C. L.

C. C. Sinha. Bacteriologic Investigation of Normal and Diseased Eyes.
Indian Med. Gazette, August, 1920, p. 288.

The eyes of 100 consecutive patients were examined by smears on slides and by cultures on agar. Dr. Sinha thinks, as a result of his investigations, that microscopic examination of a stained film is generally sufficient for the diagnosis. The varieties of organisms found by him in healthy eyes and eyes suffering from different forms of conjunctivitis, corneal ulcers, etc., agree with the observations made and recorded by others.

The following conclusion should hardly be allowed to pass. It is based on two cataract patients in whom pneumococci and streptococci were present, being successfully operated upon after a few days' treatment with protargol. He says: "Thus it appears that the presence of pyogenic organisms, even pneumococci, is no contraindication to cataract operations, provided the patient undergoes systematic treatment preliminary to operation." He should have added, "if the conjunctival sac is then found free from the organisms in question." To operate on such eyes without making sure of this is to court certain disaster.

F. P. M.

ABSTRACTS

S. Baldino. Arcus Juvenilis of the Cornea Associated with Changes in the Fundus. Arch. di ottal. v. 27, 1920, p. 50.

The author's case was a man of 33 in whom the change had begun on the right cornea, down and out, eight years before, with the same condition affecting the left eye symmetrically two years before. Vision began to fail shortly after the first objective signs, and for four years the patient complained of night blindness. When first seen, vision was R. $\frac{1}{3}$, L. $\frac{1}{3}$. Both corneae presented similar white rings near the limbus with a few fine white dots inside the ring, in the superficial layers of the cornea. There was irregular astigmatism, not improved by glasses. Both fundi showed large patches of displaced pigment at the periphery with a few smaller spots more centrally. The left eye showed a raised plaque of connective tissue up and in from the nerve, considered probably a hyalin rest. His case agreed with two of Casolino's cases in giving a probable history of hereditary clues.

The author thinks the condition a change similar to arcus senilis, due to disturbed nutrition of the cornea, the result of a constitutional malady. Apparently no cases have been reported with similar fundus changes. A bibliography is appended.

S. R. GIFFORD.

Engelking, E., and Eckstein, A. New Color Test Objects for Clinical Perimetry. Klin. M. f. Augenh., v. 64, May, 1920, p. 664.

The authors had their test objects

(described *ibid.*, Jan., 1920, p. 88) published by Speyer and Kaerner, Freiberg, Br., 1920, price 7 Mark. In testing, in good daylight, with these, from the periphery towards the center, all objects at first appear equal, viz., of the tone and illumination of the grey pattern: they are "periphery—equal," and the colorless limit of the visual field for the 5 colors lies at the same point.

At the transition from grey to color they assume their final color tone which does not change in the entire color field. The color limits for red and green, on the one hand, and for yellow and blue, on the other, coincide so that there are two possibilities, e. g., the red and green objects, to obtain the same color visual field. A premature recognition by secondary signs is excluded. The complete visual field consists of (1) the colorless limit, (2) the yellow-blue limit, (3) the red-green limit. Thus, perimetry with these objects is not only physiologically correct, but also very much simplified and easier. The qualities of the colors, of course, are exact only for a certain neutral illumination, but sufficiently so for all practical cases. C. Z.

de St. Martin. Four Recent Observations of the Ocular Symptoms of Botulism. Ann. d'Ocul., 1920, v. 157, p. 193.

The author reviews the symptoms as described by Van Ermengem in 1897 and reports in detail four cases who suffered from botulism as the result of eating smoked trout, Aug. 1, 1918. The ocular symptoms as grouped by the author were:

| Symptoms and their duration | Case 1 | Case 2 | Case 3 | Case 4 |
|---------------------------------|---------|---------|---------|---------|
| Ptosis | 40 days | 5½ mos. | 4½ mos. | 4½ mos. |
| Ophthalmoplegia Ext. | 40 days | | | |
| Mydriasis | 4½ mos. | | 4½ mos. | |
| Paralysis of Accommodation..... | 4½ mos. | 4½ mos. | 4½ mos. | |
| Hyperemia of disc..... | 4½ mos. | 5½ mos. | 4½ mos. | 4½ mos. |
| Contraction of fields..... | 5½ mos. | 5½ mos. | 5½ mos. | 5½ mos. |
| Amblyopia and asthenopia..... | 4½ mos. | 5½ mos. | 40 days | 4½ mos. |
| Asthenia | 5½ mos. | 5½ mos. | 4½ mos. | 5½ mos. |

He regards the symptoms as dependent for the most part on lesions of the cord, medulla and cranial nerves, toxic or hemorrhagic in nature. The visual symptoms are probably due to the direct action of the toxins on the retina, altho experiments on animals have not proven this. C. L.

H. Coppez. *Avulsion of Optic Nerve During Sinus Operation.* Le Scalpel No. 40, October 2, 1920.

Following resection of the middle turbinate bone in a man of 36 years there was abundant hemorrhage; arrested by plugging the nostril which provoked severe retroocular pain. Some days later, on opening the maxillary sinus by the nasal route a great quantity of pus escaped.

Immediately after the latter operation, tumefaction, immobility and protrusion of the eyeball occurred, with abolition of vision. Some days later, curettage of the ethmoid showed that it contained three tampons of wadding. There was temporary improvement followed by increase of the pain and inflammatory phenomena in the orbit of that side. On exploration the last remaining tampon was removed, saturated with pus and blood.

The pain continued, with exophthalmos, ptosis, immobility of the eyeball and pupil, and vision was abolished. On ophthalmoscopic examination the papilla had disappeared, being replaced by a continuous white plaque. Certain indistinct branches of the central retinal vessels reappeared at a distance of two diameters from the papilla.

In the course of the operation for the radical cure for sinusitis, which had been done, the inner wall of the orbit had been perforated, causing in fact a case of avulsion of the optic nerve.

DANIS.

T. Mohr. *Avulsion of Optic Nerve by Blunt Force.* Klin. M. f. Augenh. v. 64, 1920, p. 310.

A potato was hurled against the right eye of a boy aged 17, four days previously, causing intense pain and loss of consciousness. Vision 0. On account of abundant opacities of the

vitreous a whitish zone around the disc could be seen only indistinctly. After two weeks an almost round hole, about 9 D. deep, with sharp margins, was seen at the place of the disc. At the temporal peripapillary zone three fine gray concentric rings apparently represented, as shown by parallax, the gradual incline from the retina to the margin of the hole. Behind the upper margin of the excavation a white membrane appeared, in the form of a segment with sharp straight free border, which grew broader within the following days.

The patient had a typical pygcephalus with bilateral exophthalmos. In this anomaly the optic nerve frequently is held very tight in the narrowed optic foramen. In some such cases the orbital portion of the optic nerve forms with the intracranial, in consequence of the lower sella turcica, an angle open downward thus interfering with its mobility. When the exophthalmic globe was struck on a tangent, its posterior segment was intensely rotated to the right. As the optic nerve tightly enclosed in the optic foramen would not give way, a violent traction took place at its entrance into the globe. The intensely increased intraocular pressure at the moment of impact sufficed to rupture the lamina cribrosa and press the optic nerve back. The sharp margin of the hole, its depth, and later ampullar enlargement indicated that the optic sheath was not torn, only the nerve which glided backwards within the sheath. If the sheath had also been ruptured there would have been no hole noticeable as it would have been filled with the orbital contents and the eyeball would have collapsed.

C. Z.

E. Charles. *Removal of Filaria from under Conjunctiva.* Indian Medical Gazette. Oct., 1920, Vol. LV, p. 378.

A Hindu, age 45, 8 mos. previously had sudden severe pain in R. E., followed soon after by swelling on inner and lower side of eyeball. The neuralgic pain subsided at night when it was cold, but increased in the daytime.

The swelling was very painful and red. There was lacrimation and dilated pupil. Vision was affected. The worm was removed under cocaine. Major Sewell, I.M.S., of the Zoological Survey of India, reports on the specimen, which was so contracted and shrunken from being preserved in spirit, as to throw doubt on the conclusions. It appeared to be a female filaria, and shrunken, measured 33 cm. long by 2 mm. in most of its length. A technical description of the specimen follows. It is stated that the normal hosts of filaria conjunctivae are the horse and the ass.

F. P. M.

T. M. Li. Practical Considerations in Refraction. National Medical Journal of China, Vol. 6, No. 2, June, 1920, p. 108.

After giving a summary of the indications for refraction, Li gives a report on several of his interesting cases, to prove that there are many factors that must be considered if the patient is to secure relief from his symptoms. His experience convinces him of the necessity for thorough cycloplegia in the great majority of cases, and also an accurate determination of any muscle imbalance before prescribing correcting lenses.

Li has examined a large number of Chinese students. He does not give the number, but of those having errors of refraction, he found 53% with myopia, 36% with hyperopia, and 11% with mixed astigmatism. He states that "the high percentage of myopia found among Chinese students may be due to the peculiar construction of the Chinese characters and the close application necessary in learning how to read and write them."

"Reading the characters does not tax the eye so much as writing them. In China, to be able to write well is quite essential in one's education, which is judged largely by one's penmanship. In order to be able to write well every dot, stroke, and turn, made by the pen must be carefully manipulated and observed. One has to put in long years of diligent practice to acquire this art. In former days, as it is to a great ex-

tent nowadays, a student was considered disrespectful if he wore glasses in the presence of his teacher. In the different ministries of today when an inferior goes to interview his superior, he has to approach him without glasses, according to usual custom and good manners. Poor hygienic surroundings, usually found in a Chinese classroom, such as poor light, lack of fresh air and proper physical exercises, faulty position and long hours of study are also important factors in the possible production of myopia."

H. J. H.

G. Wunderlich. Quinin Intoxication and its Pathogenesis, with Report of a Case. Klin. M. f. Augenh, v. 64, March-April, 1920, p. 270.

A girl, aged 24, after taking 8 grains of quinin, suddenly fell sick with vertigo, tinnitus, vomiting, diarrhea, and loss of consciousness. The next morning, she was completely deaf and blind. Five days later, she was brought to the clinic: V. R. = 5/15. V. L. = perception of light, maximal mydriasis, retinal vessels normal, and slight peripapillary opacity, optic discs of normal color. V. and visual fields gradually improved, so that at her discharge V. R. was 5/5; L. 5/20 (impaired by a scar of the cornea). At the same time the retinal vessels grew smaller and the discs became white, the palpebral fissures were wide, mydriasis persisted with slight reaction to light, visual field contracted, hemeralopia.

From his observations in this case and a discussion of the literature, W. reached the following conclusions: Quinin is a strong protoplasmic poison, which attacks with predilection the eyes and ears.

It primarily damages the nervous elements of the eye, as in W.'s case: the ganglion cells, the inner granules, neuroepithelium, optic fibres, perhaps also the central ganglion. It irritates the sympathetic, causing mydriasis, insufficient reaction of the pupil, ischemia of the retinal vessels, and damages to the vascular muscles. After longer persistence of ischemia, secondary

lesions of the nervous elements and anatomic alterations of the vessels (perivasculitis and changes of position).

The phenomena of optochin poisoning are analogous and due to the same pathogenesis.

C. Z.

F. M. Boehm. Operative Treatment of Keratosis of Conjunctiva and Cornea. *Klin. M. f. Augenh.* v. 64, March-April, 1920, p. 234.

Epithelial xerosis is distinguished from parenchymatous xerosis. The first consists in a generally localized and benign alteration of the conjunctiva, which appears like silk as if covered with white fat. Parenchymatous xerosis develops after severe destructive diseases of the conjunctiva—trachoma, diphtheria, pemphigus, cauterizations, ectropium and lagophthalmus. Elschnig proposed for it the term keratosis, as it consists, like keratosis cutis, in a real cornification. Vision is reduced to perception of light and by the shrinkage of the conjunctival sac the motility of the eyeball and the closure of the lid is impaired. It is considered an incurable disease.

The partial closure of the palpebral fissure by sutures, introduced by Rudin, attains the two goals of treatment; retention of the tears and reduction of the surface of evaporation. Boehm reports in detail 3 cases, in which this was done 4 or 5 times, with good results.

The lids are divided from both sides by intermarginal section into two plates; leaving a small opening at the lacrimal region and a central fissure from 8 to 10 mm. long. The upper and lower lids are united by simple and mattress sutures. In 10 out of 14 cases the process was arrested, and such an improvement obtained that the patients were at least partly enabled to work again.

C. Z.

Carl Behr. Ophthalmomyiasis Interna and Externa. *Klin. M. f. Augenh.* v. 64, 1920, p. 161. (ill.).

In a boy, aged seven, at the latter part of August, a circumscribed ap-

parently phlyctenular irritation developed with swelling of the cheek and palpebral conjunctiva, which in its further course led to a nodular prominence of the sclera and severe intraocular phenomena arousing the suspicion of tuberculosis or glioma. On account of blindness and the severe inflammation, the eye was enucleated.

The anatomic examination revealed the presence of the larva of a fly, most likely *Hypoderma boris*. Subretinal immigration had caused intense choroiditis and complete detachment of retina. The choroiditis was not purulent, but characterized by eosinophiles.

After discussion of the literature of this rare affection, the author summarizes: The larvae of *Oestrus*, especially *Hypoderma boris*, which as a parasite enters the body of warm blooded animals in summer or beginning autumn for hibernation, may in rare cases also invade the human eye. So far it has been observed only in children, probably on account of their more tender sclera. Generally, they are deposited in the surroundings of the eye, soon penetrate the skin and wander to the eyeball, whose outer covering they pierce. They do least harm, if they enter the anterior chamber, in which they can be easily diagnosed and extracted.

If the larva penetrates the eyeball farther back its immigration may be revealed by circumscribed phlyctenular irritation, and later by the development of a scleral nodule. This is the last moment in which the eye may still be saved, by incision of the nodule and extraction of the larva. After its entrance into the anterior, opacities of the vitreous and detachment of the retina at once develop; which prevent ophthalmoscopic examination and render diagnosis and therapy illusory. The eye is irrevocably lost and on account of irritation and amaurosis requires enucleation. It shows extensive iridocyclitis.

The ophthalmomyiasis externa observed as frequently in adults as in children, is a relatively harmless af-

fection caused by different parasitic larvae of flies. Generally the invasion occurs by the female flying against the eye and depositing its eggs. Conjunctivitis develops with swelling of follicles and formation of membranes. This disappears rapidly after removal of the usually large number of larvae.

C. Z.

Zur Nedden. Therapeutic Effect of Paracentesis of the Vitreous in Intraocular Diseases. Klin. M. f. Augenh., v. 64, May, 1920, p. 593.

Zur Nedden reports further good results from his method, of withdrawing with Pravaz's syringe from 0.5 to 1. ccm. of the liquified vitreous, in opacities of the vitreous remaining after traumatic (not spontaneous), hemorrhages, in chorioretinitis, choroiditis disseminata, and in ectogenous infections after perforating injuries.

So far he has performed paracentesis 65 times on 21 eyes, mostly ambulant cases. Adherent opacities can not be removed by the syringe. They as well as the compact stripes after hemorrhages and retinitis proliferans gradually disappear after repeated paracenteses, which improve absorption by renewal of the vitreous. Cyclitic membranes are very refractory to this treatment. In some cases no harm was done to the eyes. The author examined the aqueous and vitreous repeatedly drawn before enucleation from an eyeball affected with traumatic glaucoma and one after a perforating injury; and found that the aqueous and vitreous of not inflamed eyes contained no fibrin in contrast to the eyes of rabbits. His observations proved, that by paracentesis of the vitreous some eyes threatened in their existence, can be saved, and that some, which in consequence of dense opacities of the vitreous were according to our present views considered as blind, regained good vision.

C. Z.

E. Engelking. Family Polycythemia with Ocular Affections. Klin. M. f. Augenh., v. 64, 1920, p. 645.

Engelking reports the history of a family in which chronic polyglobulia, partly with most intense alteration of the blood, could be traced thru three generations. In all cases typical polycythemia, (Vaquez' disease), existed, without heart trouble, changes of the kidneys, or increased blood pressure. The hereditary transmission was direct to both sexes. The affections of the eyes were typical and distinguished from the usual aspect in *morbus ceruleus* (due to congenital heart trouble). The ocular and palpebral conjunctivae was lividly discolored. The retinal vessels were scarcely changed in caliber and course. The veins were very dark—almost blackish red, the optic disc ruby red from extension and greater filling of the smallest veins and capillaries of the disc and retina. These colors were due to the congestion of the blood and proportional to the number of the red blood corpuscles to the area. There were no optic neuritis or choked disc, nor signs of inflammation or congestion of the retina. The color of the eyeground was bluish red, cyanotic, which Engelking ascribes to the changes in the capillaries of the retina and choroid.

In *morbus ceruleus* tortuosity and general extension of the retinal veins are characteristic and distinguish the polyglobulias in congenital heart affections from the genuine polycythemia. If this varicosity of the retinal veins occurs in polycythemia, as observed in several cases, Engelking considers it as secondary, caused by wear and tear of the system from overloading, a sign of advanced age of the polycythemic, so to speak, because it was not encountered in his young patients. According to Engelking, polycythemia is a disease of the erythropoetic apparatus from, in his cases, hereditary disturbance of the endocrinic equilibrium.

C. Z.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo. Volunteers are needed in other localities.

DEATHS.

Willard N. Bell, Ogdensburg, New York, aged sixty-three, died October 25th, from pneumonitis.

A. Benedetti, Docent of Ophthalmology at Rome is dead.

John A. Dillon, Springfield, Massachusetts, aged forty-two, died suddenly September 12th, from heart disease.

Alanson W. Hawley, ophthalmologist and oto-laryngologist, of Seattle, died at the age of fifty-six, of angina pectoris, at Kalamazoo, Michigan, having stopped over on his way home from the American Academy meeting at Kansas City. He practiced the specialty in Seattle for sixteen years, was a member of the American College of Surgeons, American Medical Association, Puget Sound, Pacific Coast, and American Academy of Ophthalmology and Oto-Laryngology.

PERSONALS.

Dr. Theodore Eugene Oertel announces removal of his office to Rooms 1005-8 Lamar Building, Augusta, Georgia.

Dr. E. H. Carey, of Dallas, Texas, presided at the fourth annual session of the Southern Medical Association, in Louisville, November 15-18.

Dr. Walter K. Seelye of Seattle announces that Dr. S. D. Maiden is now associated with him in the practice of ophthalmology, rhinology and oto-laryngology.

Dr. George F. Suker of Chicago wishes to state that he did not accept the commission as Major in the Regular Army, tendered him by the Adjutant General, as reported in last month's issue of this JOURNAL.

Dr. Harold Gifford of Omaha expects to sail for South America in December, where he will join Dr. Casey Wood for research work in comparative ophthalmology, at the tropical station in British Guiana.

Lieutenant Colonel Henry Smith I.M.S., Retired, has cabled to Dr. D. T. Vail, Chairman of the Eye, Ear, Nose and Throat Section of the Ohio State Medical Association, his acceptance of the invitation to be the guest of honor of the Section at the next annual meeting of the State Society to be held at Columbus May 3rd, 4th and 5th, 1921, and to deliver the oration on ophthalmology.

Colonel Smith has retired from Indian medical service and will no doubt make a tour of the United States in the spring and early summer of 1921. His vast experiences as a general surgeon and especially as a cataract operator, together with his long years of service as the chief medical officer of the Amritsar District, Punjab, India, will make his visit to the States one of great interest to the profession at large.

SOCIETIES.

The Colorado Ophthalmological Society elected officers for the ensuing year. This society has no president, the chairman of each meeting is chosen at the time.

The Rhode Island Ophthalmological Society elected officers for the ensuing year as follows: President, Alva A. Fisher; Vice President, Christopher J. Astle, and Secretary-Treasurer, Joseph L. Dowling, all of Providence.

At the regular meeting of the Chicago Ophthalmological Society, November 15th, 1920, a paper was read by Dr. G. F. Suker on an "Unusual Case of Retinitis Pigmentosa," and by Dr. Robert Von der Heydt on "Microscopy of the Living Eye as Seen with the Nernst Slit Lamp of Gullstrand. This paper will appear in full in an early number of the JOURNAL.

At a joint meeting, November 18th, of the Section of Ophthalmology with the Section on Rhinology and Oto-Laryngology of the College of Physicians of Philadelphia, Dr. J. Parsons Schaeffer by invitation read a paper on "The Anatomic Relations of the Optic Nerve and Optic Commissure to the Paranasal Sinuses," with a lantern demonstration. The discussion was opened by Dr. James Bordley, Jr., of Baltimore.

MISCELLANEOUS.

A curious instance of extreme color blindness recently came to light. A post office clerk could never balance his accounts. Examination proved that he was unable to distinguish between the colors of the stamps he sold.

The Valentine Haüy Association for the Welfare of the Blind has deposited in six municipal libraries in Paris a collection of special books printed in braille type, to be placed at the disposal of blind readers.

The French Minister of Hygiene recently directed the attention of the Academie de Medicine to the frequency of trachoma in certain regions of France, especially around Marseilles.

Sir William and Lady Lister have made a donation of £5,000 to the Royal London Ophthalmic Hospital for the purpose of starting an ophthalmic convalescent home in connection with the hospital.

The Graduate School of Education, Harvard University, will conduct a course of instruction to train workers for teaching the blind and working with them. Further information may be obtained from the executive secretary, Miss Lotta S. Rand, 17 Lawrence Hall, Harvard University, Cambridge, Mass.

The Milwaukee County Dispensary has changed its personnel arrangement for professional services for its patients in ophthalmology. Formerly a number of ophthalmologists were in attendance alternating on different days of the week. Now a full term paid clinician and two assistants are employed.

At the annual meeting of the members of the Permanent Blind Relief War Fund for Soldiers and Sailors of the Allies, the chairman of the executive committee, in his address stated that since its creation in 1916, the sum of \$1,796,314.44 had been collected. This is said to be the largest total contributed to any American war relief organization outside of the Red Cross. The Fund has in hand upward of \$450,000. The total number of members exceeds 17,000.

Prior to 1914 practically all the optical glass in the United States was imported from Germany. As a result of experiments begun at the outbreak of the war, under the auspices of the geophysical laboratory of the Carnegie institution in Washington, optical glass of fine quality is now to be had on this side of the water. At first disks of three inch diameter were made. Since February of the present year one optical glass concern has listed twelve-inch disks for short-time delivery. The great difficulty to overcome is to prevent cracking of the disk in the annealing process, several flawless ones were made but were ruined in this way. An electric furnace of special design has been devised which has solved this problem, so that it is believed the last difficulty has been overcome in the way of American manufacture of the largest disks.

Those of our readers who are not subscribers should send in their names for the "News Letter," published free by the National Committee for the Prevention of Blindness, 130 East Twenty-second street, New York City. It should be a great satisfaction to us that laymen are in charge of this work, and it should be our pleasure to cooperate and assist in every way possible. The least we can do is to subscribe for the "News Letter" and

keep posted upon what the "Committee" is doing thruout the country to prevent blindness and to help those who are blind.

The Maryland Workshop for the Blind has requested an increase of \$3,000 in its municipal appropriation, now amounting to \$5,000 a year, to supplement the state appropriation, which has been increased from \$14,000 to \$16,000. Among the 200 blind men and women cared for, 154 are from Baltimore.

Dr. Blanche Norton has been awarded the Cross of King George I by the Greek government, in recognition of her work for victims of trachoma in Greece. For the last year, Dr. Norton has been engaged in trachoma eradication work in Trebizond and Constantinople, under the auspices of the Near East Relief. In the course of her service Dr. Norton contracted the disease herself and altho not fully recovered, she has returned to the United States.

During the last summer, in a trachoma survey carried on thruout Arkansas under the auspices of the United States Public Health Service, out of 1,451 persons examined in ten counties, 262 were found afflicted with trachoma. It is estimated that at least 40 per cent of the blindness in the state is caused by trachoma. The greatest number of cases, 108 out of 746 examined, was found in Searcy County. No cases were discovered in Ashland County out of 313 subjects examined.

LIGHTING. The beauty of a pretty workgirl is not enhanced by huge goggles, nor is a young man made more prepossessing by their use. Yet, in the long processions lunchwards, homewards, which trips and stumbles and strides thru our streets, there are hundreds wearing glasses. If asked by the oculist as to the lighting of store or factory or office the ready answer will be that there is "plenty of electric light; quite a glare of it." But the oculists on the Board of the Industrial Accident Commission define light as "that quantity and quality which enables normal eyes to work without discomfort," and they are trying to make employers see the economic advantages of supplying this.

When the light is insufficient the eye keeps changing its focus in a vain effort to detect details. This constant drawing up and releasing action of the fine muscular construction results in strain and definite fatigue. Also, a bright light suspended in the line of vision, or a sharp contrast and flickering on the eye gives the extra work of constant adjustment. This is not only a serious strain, but introduces a neutral stage of the pupil action by the lagging of tired muscles, which results in a momentary, partial blindness, making it almost impossible for a worker to observe the graduations of a precision instrument or lay out fine work in detail.—*New York Medical Journal*.